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Inorganic Chemical Production Down in June, Report Says

Department of Commerce Lists Tonnages of Some Fertilizer Chemicals

WASHINGTON—Production of a number of inorganic chemicals used in agriculture was down in June, 1959 from records of the previous month, but generally higher than the figures of June, 1958, according to a release just issued by the U.S. Department of Commerce, bureau of the census. In its series of monthly bulletins on "Facts for Industry," the department reports on numerous inorganic chemical products for both industry and agriculture.

Here are some of the figures as issued:

Product	June, 1959 tons	May, 1959 tons	June, 1958 tons
Anhydrous ammonia ...	386,755	413,134	336,309
Fertilizer grade ammonium nitrate	194,878	219,238	139,007
Ammonium sulfate (Synthetic) .	81,811	89,053	97,917
(By-product)	69,955	71,568	49,328
Nitrogen solutions (including combination with urea) .	52,757	91,806	35,429
Phosphoric acid (100% P_2O_5)	147,918	163,607	139,295
Sulfuric acid (total gross)	1,469,489	1,578,581	1,225,068

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Program to Study Pesticides, Wildlife Expected to Expand

WASHINGTON — Both the House and the Senate have passed enabling bills expanding the Department of the Interior's research into the effects of insecticides on fish, birds and other wildlife. One bill, S-1515, alters the bill passed a year ago so that the ceiling of $280,000 is removed and the other bill, HR-5813 puts the ceiling at $2,515,000.

The pesticide industry had hoped that the new legislation would coordinate the investigation with similar activities being carried out by the U.S. Department of Agriculture, the Public Health Service and the Food and Drug Administration as well as the land-grant colleges and private industry. This request, however, appears to have been bypassed completely.

One of the backers of the bill, Rep. John Dingell (D., Mich.) has explained that the $280,000 originally authorized was merely to get the investigation under way. Having accomplished this purpose, he pointed out, it is now time to probe deeper into the situation which he declares is more serious than was at first thought. The congressman has expressed fears that entire species of wildlife may be lost if the matter is delayed.

New Breakthrough In Plant Science Achieved by USDA

WASHINGTON — A scientific break-through in plant science, just announced by the U.S. Department of Agriculture, carries considerable significance to the pesticide and fertilizer industries.

Two researchers with the Agricultural Research Service, Beltsville, Md., have recovered from corn plants pigment forms with no impurities, which function like enzymes. The scientists, Drs. Harry A. Borthwick and Sterling Hendricks were credited by Dr. Byron Shaw, administrator of the service, as having made this discovery.

In commenting on the feat, Dr. Shaw termed it as "A key to man's complete control of plant growth from seed germination through plant flowering and fruiting." He added that the achievement is "outstanding" and represents the type of discovery for which the Beltsville laboratories were established.

The scientists, following up the fact that light controls the reddening of apples, for instance, found the critical range of light for apple coloring to be in the red region of 6,200 to 6,900 Angstrom units. Above this region, the amount of reddening of the apple declines rapidly as the wavelength of light increases toward far-red.

With soybeans growing on short days and long nights, an extremely short exposure to red light during the night will prevent the plant from flowering, they found. Conversely, an equally short period of far-red light causes the plant to flower. However, if the intensity of far-red light is increased 100 times, the plant again fails to flower.

Drs. Borthwick and Hendricks have found growth responses to be governed by a reversible chemical reaction that is controlled by the color and intensity of light acting upon two pigment forms present in plants in invisible quantities.

One form of the pigment absorbs red light and the other far-red light. The pigment form that predominates in a plant depends upon the color of light to which the plant is exposed. The form produced by the action of red light regulates plant growth and can absorb far-red light. However, if this form absorbs far-red light it is converted bark to the red-absorbing form that does not regulate plant growth, the researchers reported.

To obtain the various colors of light for the experiment, the scientists directed white light from a high-intensity electric arc through a prism to break it into all the colors of the spectrum. The portion of light used in this work was the red part of the spectrum from yellow (5,800 A) to far-red (near the limit of visible red light (7,000 to 7,500 A), which is near the range of infra-red or heat en-

(Turn to BREAKTHROUGH, page 20)

USDA Report Spurs Comments . . .

Industry Spokesmen See Progress In Control of Resistant Insects

WASHINGTON—Pesticide industry spokesmen, commenting on a recent report of the U.S. Department of Agriculture on resistance of additional insect pests of cotton, indicate that the industry has kept pace with these developments so that adequate controls are available. Despite apparent resistance on the part of boll weevils and cotton leafhoppers to some toxicants, a number of materials and combinations of materials are still controlling the pests satisfactorily.

The USDA release, reporting its 1958 tests on several central Texas farms, states that results confirm the widespread nature of boll weevil resistance and include the first evidence found in the U.S. of resistance by the cotton fleahopper.

C. R. Parencia and C. B. Cowan, Jr., entomologists of the Agricultural Research Service, stated that effective control of the pests can be achieved through use of phosphate and carbamate insecticides, as well as with 2:1 combinations of a hydrocarbon product and DDT.

A number of industry spokesmen contacted by Croplife in a telephone roundup, stated that resistance to various pesticides on the part of some insects is undeniable, but by application of combinations of materials, pests are being controlled. "The whole trend of pest control, particularly in cotton, has changed because of the resistance factor," one observer stated from his office in one of the cotton-growing states.

Another said that the phosphates are becoming popular in many areas this year, and that growers in Texas,

(Turn to RESISTANCE, page 8)

Low Populations of Grasshoppers in West This Year Require Little Control Effort

WASHINGTON—Grasshoppers and Mormon crickets required little cooperative federal-state-rancher control in Western states this summer, the U.S. Department of Agriculture has reported.

Pest control officers of USDA's agricultural research service believe that last year's effective cooperative program against grasshoppers on 5 million acres in eleven states was to a large degree responsible for the relatively low level of infestation this summer. They ascribe the similarly low level populations of Mormon crickets to timely and effective annual scouting and treating of breeding areas of these pests since 1952.

This year, only 763,900 acres of range and forest land in seven western states required cooperative treatment against grasshoppers. Some additional acreage was treated by farmers to protect crops. About 62,000 acres were baited for Mormon crickets in four states by workers of ARS and cooperating states to hold down cricket numbers.

States in which grasshopper populations were heavy and the acreage treated in each follow: Idaho, almost 65,000 acres; Montana, more than 38,000; New Mexico, more than 275,000; North Dakota, more than 12,000; South Dakota, more than 39,000; Utah, more than 89,000; and Wyoming, almost 245,000 acres.

Most of the 1958 cooperative grasshopper program centered in five lower Great Plains states—Colorado, Kansas, New Mexico, Oklahoma, and Texas. Of these states, only New Mexico required a cooperative program this

(Turn to GRASSHOPPERS, page 5)

Sulfuric Acid Plant to be Built

CHICAGO — Leonard Construction Co. of Chicago has announced receiving the contract award for engineering and construction of a contact sulfuric acid plant at Nichols, Fla. for the Virginia-Carolina Chemical Corp.

The plant, which will use elemental sulfur as a raw material, will have a rated daily capacity of 500 tons and be capable of operating at 600-ton production. The plant will use Monsanto Chemical Co. vanadium sulfuric acid catalyst. The acid will be used for additional production of phosphate rock, phosphoric acid and fertilizers.

Construction will begin immediately, Leonard said, with completion scheduled for June, 1960.

Seek Seaway Port Control of Plant Diseases, Insects

MINNEAPOLIS—Ways to protect the twin ports of Duluth, Minn., and Superior, Wis., against invasion by foreign insect pests and plant diseases that may be riding ships plying the St. Lawrence Seaway are being sought by state officials and industry.

Many aspects of this problem were considered at a meeting in Duluth Aug. 13 called by Byron G. Allen, Minnesota agriculture commissioner.

The meeting was attended by federal and state quarantine officials, U.S. Customs representatives, officials of the grain trade, the Rust Prevention Assn., grain inspectors and port authorities, and state warehousing and railroad officials. Representatives of the Canadian Department of Agriculture were also present.

Port of entry inspection, similar to that provided at Atlantic and Gulf seaports, is needed to protect agricultural interests of the Midwest, now vulnerable to pest invasions from abroad since the opening of the St. Lawrence Seaway, according to Mr. Allen.

Federal regulatory and inspection programs were explained by H. S. Dean, assistant director of the plant quarantine division of the U.S. Department of Agriculture, who reported that a supervisory inspector had been assigned Aug. 6 to study the pest prevention problems associated with both maritime and air traffic since the opening of the seaway last month.

Mr. Dean made special reference to the khapra beetle. Recent discovery of this pest by plant quarantine inspectors in ships and cargoes arriving at several U.S. seaports has been of additional concern to port areas along the St. Lawrence Seaway.

J. F. Spears, plant pest control division, also represented USDA at the meeting. He described the control and eradication measures now being carried on in the U.S. against the khapra beetle and other newly-introduced plant pests.

In a federal protection program, U.S. customs inspectors and plant and animal inspectors of USDA's Agricultural Research Service work together at all ports of entry to see that incoming ships bring no foreign insects, diseases or other pests harmful to U.S. crops and livestock. Canadian and U.S. regulatory agencies cooperate closely in mutual protection against dissemination of foreign diseases and pests.

Agricultural Research Service inspectors also examine exported plants, plant products, livestock and animal by-products such as hides, meat scraps and tallow for the presence of pests and disease so that they may meet entry requirements of the countries of destination.

Demand for such export certification is expected to greatly increase with single loading, water freight shipment available to the Grain Belt, and to midwestern and western livestock ranges.

The need for a general understanding of these regulatory problems has become more critical since the seaway opened. The twin Duluth-Superior ports, for instance, were visited by 26 merchant ships from foreign ports during the week of July 19-25. The cooperation of both importers and exporters served by the seaway in observing quarantine regulations will contribute immeasurably toward keeping the Midwest free of foreign pests.

Last year Agricultural Research Service plant quarantine inspectors barred a destructive plant pest from entering the U.S. every half-hour. They boarded more than 59,000 vessels at U.S. ports.

RICE FIELD DAY

SACRAMENTO—The University of California's Rice Field Day was held Sept. 4 at the Rice Experiment Station near Biggs, Cal. The program included presentations on the chemical control of watergrass by Kenneth L. Viste, U.S. Department of Agriculture specialist from Davis, and discussions of rice pests including the rice water weevil.

Symposium Planned On Phosphate-Soil Chemical Reactions

WILSON DAM, ALA.—The Tennessee Valley Authority and the Southern Regional Soil Research Committee (Fertilizer Evaluation Work Group) will sponsor jointly a symposium on the chemistry of phosphate-soil reactions at Muscle Shoals, Alabama, on Jan. 27, 28, and 29, 1960, TVA has announced. The symposium will occupy the morning sesions on the first two days.

The final session on Friday morning, Jan. 29, includes reviews of cooperative work with states, with emphasis on fertilizer salt effects on germination and growth and on studies with fused potassium phosphates. Afternoon sessions on Jan. 27 and 28 will be devoted to planning, involving only the sponsoring groups and cooperating states.

Speakers for the phosphorus symposium will include Drs. P. R. Stout (Univ. of Calif.), M. L. Jackson (Univ. of Wisc.), N. T. Coleman (N.C. State College), Sterling Olsen (A.R.S., Colo. State Univ.), M. Peech (Cornell Univ.), M. Fried (A.R.S., Beltsville, Md.), and TVA researchers.

Soil scientists and commercial representatives interested in technical research in these fields are invited to attend. For information on hotels, program, etc., contact George Stanford, Chemical Engineering Building, TVA, Wilson Dam, Ala.

California's Search for Hoja Blanca Reveals None

SACRAMENTO — No evidence of hoja blanca, a destructive rice disease, has been found in California, according to the California Department of Agriculture.

The new search for the disease and its plant hopper carrier was touched off by discovery of an infestation near Covington, La., by entomologists and plant pathologists of the U.S. Department of Agriculture. Previously the disease and its carrier had been reported from Florida and Mississippi.

The spread of hoja blanca is of great concern because of its potential to ruin entire rice crops.

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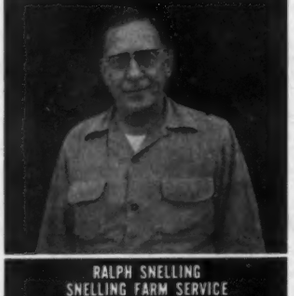

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TALL CORN IN TENNESSEE—Graphic testimony to the efficiency of good fertilization is seen in the adjacent rows of corn. The signs tell the tale: On the left is Frank Smith, Monroe County, Tenn., farmer who cooperated with the University of Tennessee in soil fertility demonstration program. Mr. Smith's corn received 210 lb. nitrogen, 90 lb. phosphates, and 90 lb. potash an acre. The check plot at right, with Ray Stamey, Monroe county agent, received no fertilizer at all. Specifications of the soil are identical. Mr. Smith wanted to raise more corn an acre than had ever been raised before in his county. Dry weather at planting time reduced his plant population, but a striking difference is seen between the results of commercial fertilizer as used on the plot at left, and the other plot.

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INSECT, PLANT DISEASE NOTES

Root Rot Threatens Texas Beet Growers

WELASCO, TEXAS—Beet growers in this area are faced with two plant diseases—root rot and black spot. Root rot has been quite serious in many fields, according to W. H. Friend, associate county agent.

He says there is no way to eradicate it, but cultural practices and strip fumigation are helpful.

The county agent said that black spot, which occurs on the roots, indicates a boron deficiency, and will be more prevalent when drouth appears.

Experiments by Dr. Bailey Sleeth of the Valley Experiment Station indicate that small quantities of borax added to the banded fertilizer will prevent the disease. In successful tests he used about 50 lb. to the acre.

Corn Pests Increase in Wisconsin Grain Fields

MADISON, WIS. — Both European corn borer and corn earworm moths are continuing to increase. It is expected that untreated, late-planted sweet corn will have significant infestations. Recent dissections in Dane County revealed 93% of the European corn borer moths had emerged, and 7% were in the fifth instar. At Rochelle, Ill., there were 12 white, 4 black, and 8 hatched egg masses per 100 plants where earlier treatments had been made.

Heavy feeding on corn silk by exceptionally large numbers of northern corn rootworm adult beetles in southern Columbia County may result in poor pollination and poorly filled ears in late plantings of sweet corn.

In central Wisconsin where redlegged grasshopper populations were high last year, a survey during the last week of July this year revealed comparable numbers, but since then their numbers have dropped about 30%. It appears that rains and humid conditions have been influencing factors. Grasshoppers in at least southern sections have advanced rapidly in their development. Eggs are now common on the front parts of automobiles as a result of smashed female grasshoppers. Where grasshoppers are numerous some spraying is reported. The adult grasshopper survey is underway and will be encompassed in later reports.

Yellowing and stunting of alfalfa, due to the leafhoppers and plant bugs is apparent in some fields in some areas, but varies greatly, it seems, because of the wide extremes of harvesting periods as related to the insects involved, as well as regrowth conditions.

Populations of the tomato hornworm have been low, as have been populations of other related species of the hawk moths. Both "tobacco worms" and grasshoppers have presented less of a problem to tobacco growers, who are now harvesting, than they have for many a year.

The only armyworm outbreak reported in the state was a localized (2 farm) area in Kewaunee County where hail had destroyed oats, and armyworms were estimated at between 6 and 12 per square foot.

Earworms and Other Pests Found in Missouri

COLUMBIA, MO. — Damage from earworms alone, or a combination of earworms and sorghum webworms, is showing up. Yields of grain sorghum have been cut as much as 50% or perhaps more in some fields.

In the central and northern sections of the state, webworms have seriously injured—and in some instances killed out—new seedings of alfalfa. This is an extremely unusual occurrence, and to make it even more unbelievable, we have not been finding many worms in old established stands. Some early seedings of rye and barley are also being injured by fall armyworms.

Desert Locusts Expected To Increase in Asia

ROME, ITALY—The desert locust problem is going to get worse, according to the Food and Agriculture Organization.

In a recent meeting at Rome, experts said the plague now extends from the Atlantic to India and Pakistan. These two countries were invaded by locusts this year for the first time since 1955. Experts have urged that national air units be expanded as the most effective form of mobile reserve. They say aerial control is considerably more effective than ground operations and that aircraft are especially valuable for reconnaissance.

New Fly Pest Found In State of Virginia

BLACKSBURG, VA. — Entomologists at Virginia Polytechnic Institute report that a fly, similar to the house fly, has been introduced from Europe and was reported in Virginia for the first time last spring. To date Bath and Highland counties seem to have had the most complaints, although some of the flies have been found in other areas.

The flies cluster in large numbers around the eyes and noses of animals in pastures. They suck available liquids and irritate the eyes so that

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swelling occurs and tears wet the faces of the animals. The adult flies are found most often in bright open areas, especially on light-colored surfaces. The males congregate especially in the sun on fences, walls, or trees. They tend to leave animals when the animals enter buildings.

The irritation caused by the flies can reduce weight gains in beef cattle and decrease milk production in dairy cows.

The life history of this new pest has not been studied in the U.S. Eggs are laid on tiny stalks over patches of cow manure or other excrement. The yellow larvae, when mature, move into the soil to pupate. Adults are active from early spring to late fall, and overwinter in large numbers in buildings. They may gather with cluster flies, which they resemble. In Europe they are seldom troublesome in houses in the fall, but may be serious nuisances in the spring when they emerge.

Wyoming Spraying Project Covers 236,361 Acres

CHEYENNE, WYO.—The 1959 Wyoming cooperative grasshopper control program, covering 236,361 acres at a cost of 48¢ an acre, totaled $113,453.28, according to Everett Spackman, state entomologist.

Mr. Spackman said the program covered 148,981 acres in Johnson County; 25,374 in Park; 7,560 in Goshen; 28,074 in Sheridan; 10,500 in Hot Springs, and 15,872 in Fremont.

The aerial spraying project began July 11 and ended recently.

Bollworms, Weevils Cut Down South's Cotton Yield

MEMPHIS — Mid-South cotton farmers are moving into full scale cotton harvesting as bollworms, boll weevils, red spiders and boll rot continued to take their toll of the crop.

Bollworms and boll weevils are showing up in increasing numbers in the Mississippi Delta after almost daily showers. Cotton is rank, boll rot is increasing and some farmers are moving fast into defoliation programs.

A few Tennessee farmers have started picking cotton and there is a considerable infestation of boll weevils in the southern tier of counties in West Tennessee, according to H. T. Short, extension district agent at Jackson. He said that some farmers are continuing their boll weevil and red spider control efforts.

In Tipton County, Tennessee, Wayne McGowan, county agent, said that because of heavy nitrogen fertilization and heavy rains cotton stalks are growing larger than usual and that a late crop is expected.

Grover Dowell, Arkansas extension entomologist, reports bollworm moths are present in large numbers and that heavy egg deposition continues. He said that apparently only a small percentage of the eggs are hatching but that a bollworm control material should be included in every application. "This is the type of year that bollworms are apt to be attracted to soybeans," Mr. Dowell warned.

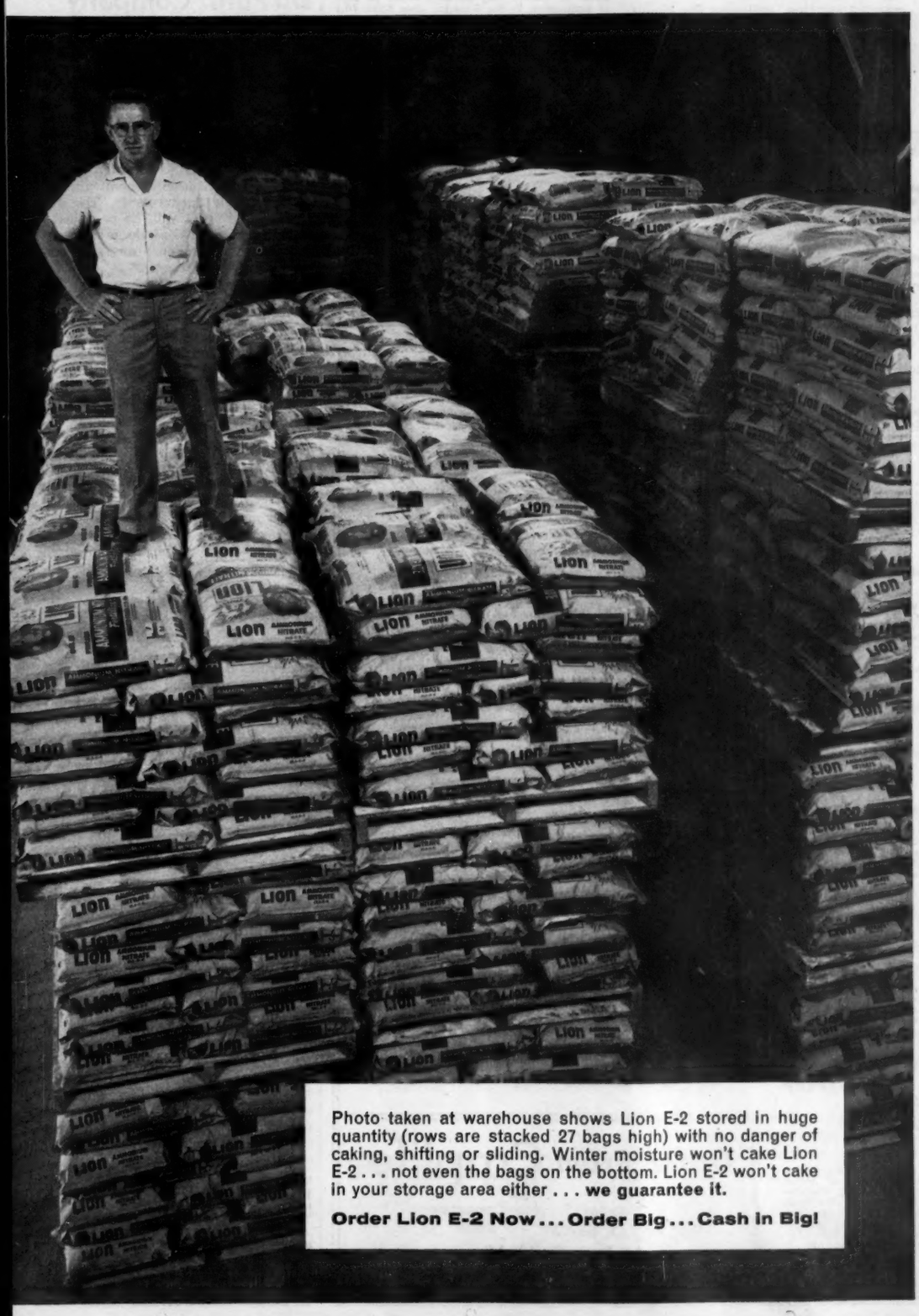
He also reported that aphids are building up in some fields. Spider mite activity is decreasing, he noted, but cotton leafworms are appearing in damaging numbers in some fields.

Drouth in Indiana Makes Blight Threat Worse

LAFAYETTE, IND.—Drouth in some areas and leaf blight, spreading northward from the Ohio River, may reduce the most promising corn crop in Indiana's history, farmers in the area have been warned.

Less than five inches of rainfall covering 12 sections of the state will not contribute to maximum yield of grain development, Purdue University agronomists point out. Other sections of the state report adequate moisture.

Leaf blights, usually developing in southern Indiana by mid-August, are widespread there and are moving north. Humid weather is especially favorable for development of these blights which are spread by wind from the residue of old corn crops.



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GRASSHOPPERS

(Continued from page 1)

year. In Colorado, where almost 3 million acres were treated in 1958, infestations were at a minimum this year and farmers treated them locally to protect planted crops.

Damage by Mormon crickets which, since pioneer times, have periodically devastated crops and ranges in the West, has for several years been held to non-economic levels by annual insecticidal baiting of less than 100,000 acres in their mountain breeding places.

The crickets—actually, large, wingless, long-horned grasshoppers—move on ranges and crops in masses. Converging bands may cover hundreds of acres. Pest control workers go by jeep and horseback into the rough mountain country—most of it in the federal domain—and locate the crickets at the time they start banding for spectacular forays into the valleys. Ranchers and forest rangers also keep watch and report. Then, ground equipment or planes move in, spreading a bait of rolled-wheat impregnated with aldrin or heptachlor ahead of the migrating bands. As a consequence, Mormon crickets have not threatened crops for 5 or 6 years.

This year, 10,000 acres were baited for Mormon crickets in Montana, 9,000 in Utah, 41,000 in Idaho, and 2,000 in Wyoming.

Surveys to determine numbers of both grasshopper and Mormon cricket adults are made each fall in the West. From these surveys, workers locate potential infestations requiring further observation in the spring. Spring surveys in 1960 will show how many eggs survive the winter and are ready to hatch, and the areas where control work should be done.

POTATO BLIGHT

LONDON, ENGLAND — For the first time this year weather conditions favorable for the spread of blight occurred late in August over almost the whole of England and Wales. The disease is now present on a few scattered main crops in most regions. Some spread is expected, but this will be too late to cause loss of yield in the majority of the crops, many of which are already beginning to die down. However, it may cause some loss of September growth in crops that are still fully green, and also cause some infection of tubers.

PATENTS and TRADEMARKS

2,902,341

Process for the Preparation of Water-Soluble Metal Sulfates, Phosphates or Nitrates. Patent issued Sept. 1, 1959, to Abraham Baniel, West Romema, Haifa, and Ruth Blumberg, Mt. Carmel, Haifa, Israel, assignors to Makhtsavei Israel, Tel Aviv, Israel. A process for the preparation of water-soluble salts selected from the group consisting of metal and ammonium sulfates, phosphates and nitrates, comprising reacting the corresponding chlorides with an acid substance selected from the group consisting of free sulfuric, phosphoric and nitric acids, acid sulfates and acid phosphates, by preparing an initial aqueous solution containing the chloride and the acid substance used as a reactant, in which solution the ions present are in a state of equilibrium; causing displacement of said equilibrium by extracting said initial solution with a solvent selected from the group consisting of aliphatic monohydric alcohols having 4-5 carbon atoms, and being of limited mutual miscibility with water, in order to extract hydrochloric acid from the aqueous solution and to produce an equivalent amount of desired product; said extraction being carried out at a temperature below boiling temperature of the aqueous solution and of the solvent used for extraction; separating the aqueous solution and solvent extract from each other; keeping the aqueous solution at a temperature at which desired product separates as a solid phase from the aqueous phase; separating this solid phase from the aqueous solution; restoring the initial composition of the aqueous solution by addition of salt and acid thereto, the restored aqueous solution being then treated again by solvent extraction in order to bring about further formation of desired product.

2,902,401

Fungicidal Compositions. Patent issued Sept. 1, 1959, to James Harwood, Western Springs, Richard A. Reck, Chicago, and Walter W. Abramitis, Downers Grove, Ill., assignors to Armour & Co., Chicago. A fungicidal composition comprising from about ten to about 6,000 parts per million of a double salt of a heavy metal salt and an amine hydrochloride, said double salt comprising a 2:2:1 molar ratio of amine:hydrogen halide:heavy metal salt, said amine having the formula RR'R'N, wherein R is an aliphatic hydrocarbon radical having from 8 to 20 carbon atoms and R' is selected from the group consisting of hydrogen and an aliphatic hydrocarbon radical having from 1 to 20 carbon atoms, and an inert adjuvant as a carrier therefor.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of $25 must accompany each notice of opposition.

Design, representing a ribbon scroll with letters F & B on it, for insecticides, fungicides, miticides, herbicides, and crab-grass killer as well as for industrial chemical uses. Filed July 5, 1957, by Faesy & Besthoff, Inc., New York. First use 1950.

Pirazinon, in capital letters, for ingredients used in the manufacture of insecticides. Filed Sept. 4, 1957, by Geigy Chemical Corp., Ardsley, N.Y. First use April 14, 1954.

15-J, in heavy letters, for controlled solubility phosphate compound. Filed May 2, 1958, by Hagan Chemicals & Controls, Inc., Pittsburgh, Pa. First use Sept. 17, 1957.

Farmers Quality Fertilizers, in capital letters on rectangular background, for commercial fertilizers. Filed Oct. 27, 1958, by Farmers Cotton Oil Co., Wilson, N.C. First use in 1940.

Two New Marketing Groups Created by Du Pont Company

WILMINGTON, DEL.—Sales of Du Pont agricultural and industrial products made by the company's industrial and biochemicals department will be consolidated under two new groups, the company has announced.

The industrial chemicals division will be responsible for the sale of all industrial chemicals formerly handled by the Grasselli chemicals and polychemicals departments. The biochemicals division will be responsible for all agricultural products formerly handled by these departments as well as sales of anti-freezes.

The changes, effective Sept. 1, are in line with a trend in the company toward specialization to encourage maximum growth in major marketing areas, according to Clark W. Davis, general manager of the industrial and biochemicals department. That department was formed last June by combining the operations of the old Grasselli chemicals department with the nitrogen products, industrial chemicals and anti-freeze products formerly handled by the polychemicals department.

Thomas H. McCormack, formerly director of sales for Grasselli products, has been appointed general director of sales for the department.

John H. Daughtridge, former sales director for the chemical products division, will become director of sales of the industrial chemicals division and William B. M. Tracy, Jr., will be assistant director. Products to be sold by this division include: sulfuric acid, urea, inorganic acids, methanol, solvents, reagent chemicals, "Mycoban" sodium and calcium propionates, sodium and potassium silicates, adhesives, hydrogenated products, colloidal oxide, flame retardants, wood treating chemicals, galvanizing and tinning fluxes, and other products for the steel, textile, paper, leather, food, pharmaceutical, and chemical industries.

W. James Latimore, former assistant director of sales for biochemicals, was named director of sales for the biochemicals division and Arthur M. Cole, assistant director. Among the biochemical and agricultural products to be handled by this organization are urea feed and fertilizer compositions, insecticides, fungicides, weed and brush killers, soil fumigants, "Uramite" fertilizer compound for turf, non-nutritive sweeteners, chemicals for animal health and nutrition, and the garden chemical line which includes weed killers, insecticides, fungicides, and combinations of these in ready-to-use packages.

With few exceptions, other personnel will continue in the same locations and the same assignments as before, Mr. Davis said.

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Donald P. Hopkins

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Time of Planting and Row Spacing Studied In Connection With Fertilization Tests

TIFTON, GA.—Some tests in fertilization of leafy vegetables will be conducted at Georgia Coastal Plain Experiment Station during the fall of 1959, according to O. J. Woodard, head of the horticulture department.

Mr. Woodard said early tests would be made with nitrogen, and that some on use of phosphorus and potassium are to be conducted later on.

Donald A. Hegwood, assistant horticulturist at the station, will conduct the fertilizer tests.

Mr. Hegwood has conducted tests on time of planting, and row spacing, and results will not be released until experiments have been done over a period of three years.

In the time of plantings tests, plantings were made on Feb. 13, March 2, March 19 and April 1. Other plantings were started on July 15, and plantings will be made at 15-day intervals through April of next year, he said. In the row spacings, plantings were made in 8-inch, 16-inch, 24-inch, and 32-inch rows.

In the tests 2,500 lbs. of an 8-8-8 grade was used to the acre. Of this amount, 1,500 lbs. was broadcast before planting, 500 lbs. placed in the drill before planting seed, and 500 lbs. used as side-dressing. Three hundred pounds an acre of ammonium nitrate was used from three to five weeks following planting.

The fertilization program used is not necessarily a recommendation of the experiment station, it was pointed out, but was used to gain research data on which positive fertilizer practices could be used. The fertilizer used in the test is an arbitrary amount based on amounts considered adequate for satisfactory crop growth.

While the Coastal station has done some research work on leafy vegetables, this is the first year that a full-time leafy vegetables research worker has been at work at the research center, the station says.

Georgia Farmer Aims For 200-Bushel Yield With Top Fertilization

DOUGLAS, GA.—On the farm of Ira Harper in Coffee County a corn-nitrogen-irrigation demonstration is opening eyes of visitors to the value of following good cultural practices, according to Harold Gurley, agronomist with the agricultural extension service.

Mr. Harper has his sights set on making 200 bu. of corn per acre, and has followed soil test recommendations on the amount of fertilizer to use to produce such a yield. His demonstration is one of six in the state showing how corn can be produced with irrigation and plenty of fertilizer.

Mr. Harper planted his corn under supervision of the county agent, Larry Torrence, and applied 1,000 lb. of 5-10-5 fertilizer at planting. He planted the corn in 40 in. rows and 9 in. in the drill, giving 16,000 plants per acre.

When the corn was 30 days old, Mr. Harper applied 100 lb. of nitrogen through the irrigation system. When it was two months old he applied another 100 lb. the same way.

This method of growing corn was recently explained to all south Georgia county agents when they met on the Harper farm for a corn clinic.

Fertilizer Control Officials Announce Meeting Plans

WASHINGTON—Program plans for the Association of American Fertilizer Control Officials meeting, to be held at the Shoreham Hotel here Oct. 16, have been announced.

Included in the meeting plans are:

"In-Plant Shrinkage," by Dale C. Kieffer, Smith-Douglass Co., Inc., Norfolk, Va.

"Some Observations on the NPFI Chemical Control Research Project," by Dr. A. J. Duncan, Johns Hopkins University, Baltimore, Md.

"I.B.M. Equipment for Tonnage Reports," by M. B. Rowe, Virginia Department of Agriculture, Richmond.

"I.B.M. Equipment for Analytical Reports," by R. C. Crooks, Florida Department of Agriculture, Tallahassee.

"Summary of State Fertilizer Laws," by Dr. Stacey B. Randle, New Brunswick, N.J.

"Summary of Tonnage Reports," by Bruce Poundstone, Lexington, Ky.

Also included in the program will be reports of investigators and committees.

Dutch Elm Disease Hits 3,500 Wisconsin Trees

MADISON, WIS. — Around 3,500 known cases of Dutch elm disease have been recorded by Wisconsin officials for the 1959 season. Reports indicated that the disease was tapering off, but in a single week the state department of agriculture said it had diagnosed 114 new cases.

Three lake shore counties—Milwaukee, Racine and Kenosha—have 1,804 of the cases. The remainder are scattered in a dozen other counties, all in the state's southeastern corner.

The department said control efforts in many communities are encouraging despite an increase in the disease this year.

"Losses in these areas are less than 1% of the total number of elms even though the disease has been present for several years," it said.

The elm tree killer, spread by the elm bark beetle, was first found in Wisconsin in 1956.

Weed Spray Increases Pasture Grasses 100%

FAYETTEVILLE, ARK.—A University of Arkansas researcher says a recent study involving the use of a chemical spray to control brush on North Arkansas hill land produced "encouraging results."

Dr. A. M. Davis, associate agronomist, said the experiment was carried out on 80 acres of land just northwest of here.

The land was aerially sprayed in 1957 with 2 lb. of 2,4,5-T acid equivalent an acre in 4½ gal. of diesel fuel. In June of 1958, the tract was resprayed with 1 lb. 2,4,5-T an acre.

Since the sprayings, the amount of brush and weeds has decreased and the growth of pasture grasses has increased an estimated 100%.

Dr. Davis said Little Bluestem is the dominant grass on the plot. Sagegrass, Bib Bluestem, Indiangrass, switchgrass and Muhley make up the remainder of the grasses.

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Spencer Announces Key Personnel Shifts; Will Establish New District Sales Office

J. E. Straub

S. R. White

F. E. Best

KANSAS CITY, MO.—Spencer Chemical Co. has announced changes in top production and sales management personnel in its agricultural chemicals division. These changes follow the recent election of new Spencer officers which saw John C. Denton, formerly vice president—agricultural chemicals, become company president. (Croplife, Aug. 10, page 6.)

The changes, as announced by Byron M. Kern, new vice president—agricultural chemicals, are as follows:

Jack E. Straub, formerly assistant to the vice president, becomes general manager of production.

S. Ray White, formerly sales manager, becomes general sales manager.

Francis E. Best, formerly North Central district sales manager (Chicago) moves to Kansas City to become sales manager.

W. Dave Van Aken, formerly Midwest district sales manager (Kansas City), moves to Chicago to become North Central district manager.

Ralph Willits, formerly Minnesota sales representative, moves to Kansas City to become Midwest district manager.

Mr. Straub, Mr. White, Mr. Best and Mr. Willits will be located in Spencer's general office in the Dwight Building, Kansas City, Mo.

Spencer has also announced the establishment of a new district sales office for the agricultural division, at Omaha, Neb. It will be headquarters for a seven state area to be known at the Northwest district.

The new Northwest district office will be located at 8401 West Dodge in Omaha. It will be the central point in the sales activities for Spencer agricultural products in the states of Iowa, Minnesota, North and South Dakota, Nebraska, Wyoming and Montana.

Formation of the new area brings to five the number of sales districts for Spencer's agricultural chemicals division. Other district offices are located in Chicago, Kansas City, Memphis, and Atlanta.

KENNETH KEITH DIES

KANSAS CITY, MO.—Kenneth A. Keith, 43, appointed by Spencer Chemical Co. on Sept. 1 as manager of its new district sales office in Omaha, Neb., died of a heart attack on Sept. 9. He had been associated with Spencer's agricultural chemicals division for the past 12 years. Prior to his latest assignment, he was manager of agricultural market research. Mr. Keith joined the company in 1947 as a junior sales representative, and later became a junior market analyst. By 1950, he had been named a senior market analyst and in 1955 was made manager of agricultural market research for Spencer. He was well known throughout the agricultural chemical trade, having attended numerous industry meetings for many years. Surviving are his widow, a son and a daughter.

K. A. Keith

Wyoming Places Ban on Shipping Weed Seeds

CHEYENNE, WYO.—Producers of grain feed or seed in the state face quarantine of any shipments into adjoining states if noxious weeds or weed seeds are found in the shipments, the State Agriculture Department announced Sept. 2.

William T. Kirk, Wyoming agriculture commissioner, said a complaint had been received from an adjoining state that quantities of noxious weed had been found in shipments of seed from Wyoming but declined to identify the state. He added that unless shipments of seed are accompanied by certificates of inspection, stating the seed is free of noxious weed seed, they are likely to be quarantined.

Among the noxious or undesirable weeds, are horse nettle, Canada thistle, white top and Russian knapweed. Mr. Kirk explained that the list varies from state to state and even from county to county.

AGRO-FORESTRY MEETING

PRINGLE FALLS, ORE.—The second Argo-Forestry meeting will be held here Sept. 29-30, announced F. Todd Tremblay, National Plant Food Institute.

RESISTANCE

(Continued from page 1)

Louisiana, the Mississippi Delta and Arkansas are using combinations of phosphates and chlorinated hydrocarbons in successful control projects.

"This matter of resistance is an old story by now," one pesticide manufacturer observed. "While the extent and seriousness of resistance sometimes tend to be overemphasized," he said, "the fact of its existence is well substantiated and can't be ignored."

The USDA report says that tolerance of boll weevils to two widely-used chlorinated hydrocarbons had increased to such a degree that "satisfactory control of heavy infestations with these insecticides was impossible during the 1958 tests." It reminds, too, that since 1955, cotton growers in some areas of Louisiana, Mississippi, Arkansas, and South Carolina have been reporting similar experiences in trying to accomplish weevil control. "The occurrence of resistant boll weevils in the Mississippi Delta was demonstrated by Louisiana State entomologists in 1955," USDA says.

Cotton fleahoppers resisted test dosages of three hydrocarbons at strengths up to three times more concentrated than those previously used to maintain control, the report said. "The populations of young fleahoppers increased on the infested plants during treatment with these insecticides, showing that lack of control was not due to new migrations of adults into the area," it continued.

In one USDA experiment, a previously-effective dosage of toxicant reduced the population of overwintering weevils only 65% and failed to establish effective control over cotton fleahoppers. On the other hand, an organic phosphate, and a carbamate, gave a 90-100% reduction in weevil population and good control of the fleahopper, according to USDA.

Of the total squares examined about a month after the initial treatment, the entomologists reported an average of 8.4, 7.6, and 22.6% weevil-infested squares in the plots treated with an organic phosphate, carbamate, and chlorinated hydrocarbon insecticide, respectively.

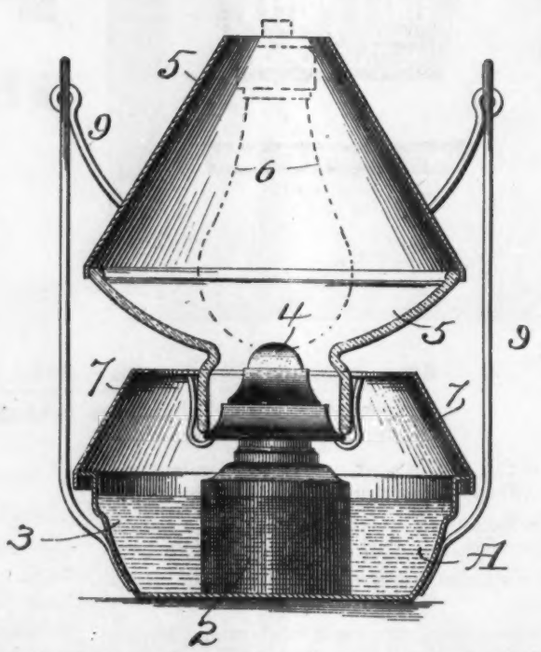
"This whole matter of resistance is no reflection on the pesticide industry," according to one spokesman in the East. "By using combinations of existing pesticides and also by introducing new products, the industry has enabled cotton growers to keep pests under control when sound recommended programs were followed.

"There have also been instances where resistance was blamed where it may have been only a partial factor in the failure of a control program. Poor application jobs can cause failure, and so can poor formulations, although most of the latter are being standardized. I'm not inclined to blame everything on the resistant bugs, although there is plenty of evidence to convince anyone that resistance is a real thing."

At least one state, Arkansas, was reported to have recommended use of chlorinated hydrocarbons for about half of the season, then to switch to phosphates to complete the control program. "Phosphates are really popular down here this year," the spokesman added.

Reminding that the USDA tests on cotton insect control were made during the 1958 season, one pesticide manufacturer predicted that the 1959 picture would be entirely different. "Sufficient proof has been obtained in the cotton states to indicate that mixtures of chlorinated hydrocarbons and DDT, if properly applied, will control weevils and other cotton insects. Just wait until the 1959 figures are published, and we will see what proper control can do in killing these resistant insects," he added.

Saga of Insect Pest Control



AN INVENTOR who wanted to let his light shine to attract and kill insects, was one Asa F. Severance, Nobleborough, Maine. On Jan. 9, 1900, he was granted U.S. patent No. 641,155 for an insect-destroying lamp arrangement, described in the patent papers as a "cheap, simple and efficient device."

As noted in the illustration above, the basic unit is a lamp, the light from which attracts the insect pest and lures him to his destruction via the flared receptacle. Within the annular space is some "insect-destroying fluid" (not identified) into which the hapless bug would fall after coming around to see what the bright lights were all about.

No mention is made in the patent papers regarding the practical use of the device, other than to describe it as being "portable."

Highway Equipment Co. Names Distributors

CEDAR RAPIDS, IOWA—New distributors for its line of fertilizer and lime spreaders have been announced by Highway Equipment Co., Cedar Rapids.

Two distributors in Texas have been named. They are the Braubach Equipment Co., San Antonio, to serve the southern tip of Texas; and Roberts Soil Service, Trinity, Texas, to serve a 39-county area in East Central Texas.

Another distributor named by the manufacturer is Lakeside Truck Body Co., Turlock, Cal. It will serve the state of California north of and including counties of Monterey, Kings, Tulare, and Inyo.

Kansas State Appointments

MANHATTAN, KANSAS—The first joint appointments in agronomic extension work at Kansas State University became effective Sept. 1 with the reassignment of two members of the present staffs, Dr. Harold E. Jones, director of extension, and Dr. R. V. Olson, head of the K-State agronomy department at Manhattan, have announced.

Under joint appointment, Robert Bohannon will be responsible for soil fertility and soil testing in extension and in charge of the soil testing laboratory and research for the experiment station. Mr. Bohannon has been a full-time extension agronomist.

Howard Wilkins, a member of the K-State agronomy staff since 1953, is to have a joint assignment under which he will continue teaching part time and, in extension, work in the field of crop improvement including seed production and certification, crop performance tests, seed distribution and cooperation with allied associations.

Ohio Firm Finds Prosperity in Liquid Fertilizers Plus Application Services

By AL P. NELSON
Croplife Special Writer

About four years ago, Norman D. Godden and Don J. Humphrey were farming in the Kingston, Ohio, area. Since both were very progressive young men and eager to try new and improved farming ideas, they started using liquid nitrogen on their soils.

Neighbors soon heard about this, and then wanted to buy liquid nitrogen from these young farmers. That gave Godden and Humphrey the idea of going into business, which they promptly did.

The result was the formation of the Flo-lizer, Inc., Kingston, Ohio, a firm dealing in liquid fertilizers. The company has grown steadily during recent years and now sells to more than 200 dealers in 20 Ohio counties.

Norman Godden handles sales for the firm and Don Humphrey handles plant and distribution. Just last year the firm erected new offices and a salesroom near the mixed fertilizer plant.

"We make 40 analyses of liquid fertilizer and we also do custom mixing," states Mr. Godden. "We also have our own soil testing lab. We will test soil samples free of charge for our dealers and customers. This is a very important service in seeing that the customer gets proper results from his application of fertilizers."

If the farmer does not wish to take the soil samples himself, Flo-lizer will do it for him, either through field men or dealers. In addition Flo-lizer will map a farmer's fields, which is a service that many of them like and find very useful.

Mr. Godden recalls that it was only a few years ago that there was some opposition to the idea of using liquid fertilizers. Some farmers thought that because it was sprayed on the ground, it could not be fully

(Turn to **OHIO OPERATION**, page 14)

PLANNING SALES STRATEGY—Norman Godden, left, and Don Humphrey, partners in Flo-lizer, Inc., discuss business beside truck on which spray tank and boom can be mounted to do custom work in prosperous farming area in which they operate around Kingston, Ohio. Partners have been in business four years.

ATTENTION TO DETAIL . . .

Helping Customer to Save Results In Sales for Pennsylvania Dealer

A campaign designed to help customers save on their fertilizer purchases has paid off with increased sales volume for George S. Snyder, Inc., Hatfield, Pa.

"Customers using up to 40 tons of fertilizer can save $100 or more each season by allowing us to deliver it in bulk," explains George S. Heckler, firm president. "We have made a major effort to bring this to the attention of our customers. As a result, a switch to bulk fertilizer has been better than we anticipated and our sales volume has also increased with it."

A personal call on all customers and non-customers helped to bring home the story. For the past three months, personal contact has been made with almost all fertilizer users in the Pennsylvania area covered by this dealer. Points emphasized by this dealer include savings, and also the ease with which the plant food may be handled. An important feature of the sales has been the bulk fertilizer bins loaned by this dealer to his customers.

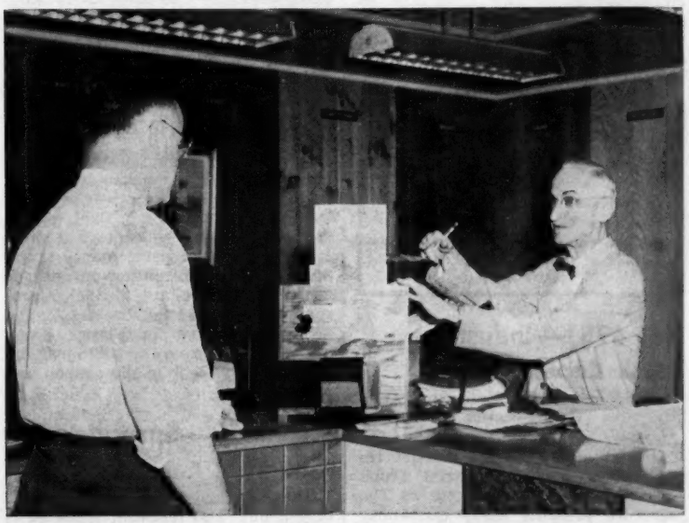
A number of bins holding 5 tons or more of fertilizer have been made available for loan. When filled, they are either picked up by the farmer or can be delivered to him by one of the company trucks. A fork lift truck makes an easy job of putting the loaded bulk fertilizer bin onto the truck for farm delivery.

Direct mail and newspaper advertising have also had an effect on increasing this type of sale and an important feature of the promotion has been the explanation that all nutrients are chemically hitched together in granular form so that the elements can't be separated during hauling and spreading operations.

The store has a miniature model of the bulk bin that it provides farmers for loan on display. How it is filled, and then made easy to operate for spreading purposes is explained to the customer. The dollar savings is another feature and backed up with the fact that the farmer has the necessary fertilizer on hand when he wants it, goes a long way in making the customer decide to buy.

The most popular formulas for fertilizer in this region are 5-10-5 and 5-10-10. Pasture grass is a major crop, followed by items such as corn, wheat, oats and some alfalfa. Several brands of fertilizer are handled by this dealer so that any farmer's requirements can be met and fulfilled.

"Free soil testing and the services of our agronomist are only some of the services that we provide our customers," points out Mr. Heckler. "We will even give these services to non-customers because we feel that this is part of our public relations operation which attracts customers to us for future purchases."



MODEL DISPLAY—How his system of bulk fertilizer delivery can be beneficial is explained by George S. Heckler, right, to a farmer customer. Mr. Heckler, president of George S. Snyder, Inc., Hatfield, Pa., displays a miniature model of fertilizer bin of the type loaned by his company to customers for easy storage and handling. Fork-lift trucks are used for this type of material-handling, he explains.

GOATS GET BRUSH-OFF

SWEET HOME, ORE.—Foresters here are experimenting with the use of Angora goats as a brush control agent in Douglas fir stands. Ten of these goats, at last count, were roaming a five-acre fenced tract on the South Santiam tree farm of Timber Service Co. The animals have been working for about a year and woodsmen estimate that the area will soon be ready for tree planting.

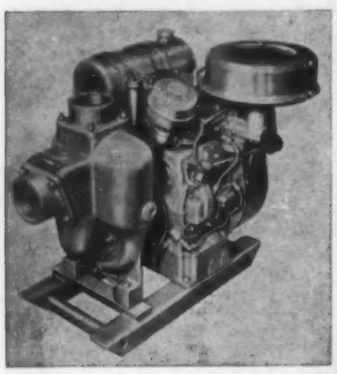
"Goats have a natural preference for heavy browse," according to Bill Penny, company forester. "When you can confine them so that you remain in control, they are an effective measure."

WHAT'S NEW

IN PRODUCTS · SERVICES · LITERATURE

No. 6953—Utility Pump

Self-priming centrifugal "Flomax" pumps of the utility type, have been added to its line of centrifugals, rotaries and self-primers by Marine Products Co. This new series of pumps was designed expressly for pumping water and other fluids of



similar viscosity at high altitudes, or for pumping fluids of higher specific gravity at lower elevations.

Other characteristics of this pump are: 15,900 GPH and pressures up to 40 p.s.i., self priming, high capacity at high heads and having straight crankshaft-to-pump connection. The latter employs a standard straight keyed crankshaft, to permit quick change of engines in the field or the rapid changeover of an iron to a bronze pump. To suit special corrosive conditions of fluids, the open adaptor construction peculiar to the MP design prevents fluids from contacting engine shaft or its bearing to cause rusting and subsequent failure. For further descriptive information on the pump, check No. 6953 on the coupon and mail.

No. 6952—Chemical Catalog

A newly revised products list of "Hooker Chemicals" has just been published by Hooker Chemical Corp. Designated as bulletin No. 100-C, it contains brief descriptions, physical data, uses and shipping information with respect to the many chemicals listed. For a copy of the bulletin, check No. 6952 on the coupon and mail to this publication.

No. 6954—Face Shield

A safety helmet with a combination acetate face protector and soft vinyl hood and bib has recently been announced by Paulson Mfg. Corp. The makers claim this new type of shield offers top-of-head, full face and chin protection while working with flying particles of dust, powder, chemicals and paints. The headgear is interchangeable and is made of light

weight plastic. Headband is adjustable for marked sizes of 6 to 8.

The face protector is made of select optical plastic and is said to be free of any distortion as well as to be fire and spark resistant. The entire unit weighs less than seven ounces and is available with either attractive white or black unbreakable headgear. For further information, check No. 6954 on the coupon.

No. 6955—Lift Truck Booklet

Described in detail in a new 24-page booklet entitled, "What Makes It Tick?", just released by Towmotor Corp., are features of a new "Stream-

Liner" series of fork lift trucks produced by the company.

Among the design features incorporated into the new lift truck models are a new lowered cowl which gives the operator full vision to the forks, on either side, a new "direct view" instrument panel, and a new treadle-type accelerator that cuts driver fatigue.

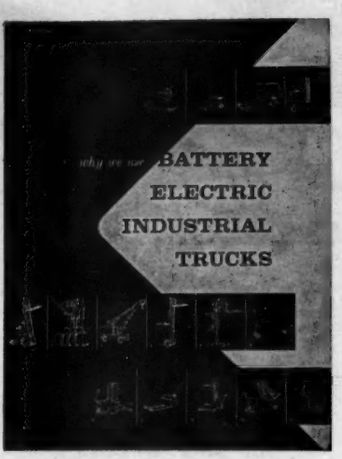
According to Towmotor engineers, all operating controls on the newly styled "Stream-Liner" Series simulate those used on motor cars—to simplify operator training. The trucks are available in 8 different gasoline, diesel, or LP-gas-powered models, with lifting capacities ranging from 2000 to 4000 lbs., the makers say. Check No. 6955 on the coupon for a copy of the bulletin.

Also Available

The following items have appeared in previous issues of Croplife. They are reprinted to help keep dealers on the regional circulation plan informed of "What's New."

No. 6951—Industrial Truck Booklet

Major construction features and operating characteristics of a battery-powered industrial truck are contained in an 18-page booklet released by Electric Industrial Truck & Allied Products Manufacturers. The literature presents many quotations of what users have to say about the product. Title of the booklet is "Why We Use Battery-Electric Industrial Trucks." A three-page section is devoted to the power source, batteries, chargers, motors and controls. A variety of safety features are listed. Interested persons can obtain copies by checking No. 6951 on the coupon and mailing to this publication.



No. 6943—Weed Killer Literature

Reasor-Hill Corp. has announced the availability of literature on the firm's granular weed killer, R-H Weed Rhap-20. The literature answers many questions, the company says, frequently asked about the product including what weeds it can kill, how to use and costs. A special portion on weeds in corn is contained. For copies of the literature, check No. 6943 on the coupon and mail.

No. 6945—Warehouse Layout Brochure

"Warehouse Layout: Narrow Aisles or Wide?" is the subject of an eight-page brochure published by the Automatic Transportation Co. This brochure is designed as a guide for the best type of warehouse for individual installations. Four pages of Automatic equipment in operation illustrate certain ways to solve the narrow-wide aisle problem. For copies of the brochure, check No. 6945 on the coupon and mail.

No. 6944—Auto Leasing Study

A study for executives and financial officers, recently published by the Foundation for Management Research, analyzes the advantages and disadvantages of leasing auto fleets for company salesmen in cities and over-the-road. The 24-page study includes full charts on costs involved in different fleet plans, and is based on records covering 29,264 autos. The report is titled "Advantages and Disadvantages of Auto Fleet Leasing: A Comparison of Company Ownership, Salesman Ownership and Leasing." For copies, check No. 6944 on the coupon and mail.

No. 6949—Helicopter Spraying Booklet

Information about spraying, dusting and fogging by helicopter is discussed in a booklet recently released by Hiller Aircraft Corp. Photographs of the Hiller 12 E helicopters at work in the field, brief performance specifications and information on charger operator services are also also presented. Copies of the booklet, called "New Workhorse for Forest, Farm and Ranch," can be obtained by checking No. 6949 on the coupon and mailing.

No. 6950—Spreader Choice

The "Challenger," a power-take-off driven lime and fertilizer spreader is now available with single spinner and 18 in. conveyor or double spinners and a 24 in. conveyor, announced Highway Equipment Co. The unit is a positive feed, self-unloading spreader. The conveyor and spinner system op-

Send me information on the items marked:

- ☐ No. 6943—Weed Killer
- ☐ No. 6944—Auto Leasing Study
- ☐ No. 6945—Warehouse Layout Brochure
- ☐ No. 6947—Handle Bag
- ☐ No. 6948—Broadcasting Unit
- ☐ No. 6949—Helicopter Spraying Booklet
- ☐ No. 6950—Spreader Choice
- ☐ No. 6951—Industrial Truck Booklet
- ☐ No. 6952—Chemical Catalog
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- ☐ No. 6954—Face Shield
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erates off the power-take-off. Body capacities range from 4.6 cu. yd. on the 9 ft. single spinner body to 8.8 cu. yd. on the 15 ft. double spinner model. More information including literature, complete specifications and name of distributors may be obtained by checking No. 6950 on the coupon and mailing.

No. 6948—Broadcasting Unit

Larson Machine Co. announces a "Broad-Caster" for broadcasting pellet type fertilizer or small grains. A feature of the machine, according to the company, is a specially designed feed opening slide connection that eliminates the need of disconnecting control parts when removing units. Opening, closing and adjusting are handled from one control within reach of the tractor seat. The feed slide control arms provide for adjustment

on either side separately. A "Jabitator" agitator has been designed to reduce speed of motion so the fan shaft can be used for agitation to maintain a constant flow without causing violent churning of material. For more complete information about the product check No. 6948 on the coupon and mail.

No. 6947—Handle Bag

Designed to lessen the load of carrying bulk packaged products in 25 lb., 40 lb., and 50 lb. multiwalls, the Hudson Pulp & Paper Corp. is pro-

ducing bags with side carrying handles. The construction of the handles provides for a pull of up to 250 lb., the company said. According to company literature, the handle bag was developed primarily because of the sharp rise in retail bulk packaging to increase saleability of the product and to lessen the handling cost to retailers. The handle feature encourages customers to carry home one or more packages. For details about the product check No. 6947 on the coupon and mail to this publication.

NEW NURSERY

LITTLE ROCK, ARK.—The Cantrell Gardens, Inc., 8112 Cantrell Road, Little Rock, has filed articles of incorporation with Arkansas Secretary of State C. G. Hall to operate a "nursery business." Incorporators were Mark T. and Hazel C. Hordan and Reno Ghiddati, all of Little Rock.

Fertilizer Sales in Kansas Hit All-Time High, 289,688 Tons

TOPEKA, KAN.—Commercial fertilizer sales to Kansas dealers reached an all time high for the year ended this past spring. Some 289,688 tons of fertilizer were sold by manufacturers—50,067 tons above the previous record set in the fiscal year 1952-53. Tonnage of actual plant nutrients contained in the fertilzer sold also reached a new high of 107,538 tons, according to the State Board of Agriculture's Control Division. The information, compiled twice annually from manufacturers' reports of sales, shows new high records set in both fall, 1958, and spring, 1959.

Greatest relative increases came in sales of potash, second in phosphate and important increases as well in most nitrogen fertilizers. Some lower analysis mixed goods showed a drop while nearly all higher analysis showed gains.

Plant foods in liquid form were an important new entry in the report. Sales of these for the year included 23,050 tons of liquid nitrogen solutions and 5,035 tons of liquid mixed fertilizer.

Washington county led the state in fertilizer purchased during the spring season with a total of 6,013 tons, most of it being ammonium nitrate. Other leading counties in the order of tonnage were Finney, Sedgwick, Neosho, Crawford, Miami and Jefferson.

Biggest sellers were mixed fertilizers—52,181 tons, and ammonium nitrate—45,248 tons. Among mixed grades, most popular were 16-20-0 with sales totaling 38,188 tons; 8-24-8—18,480 tons; 16-48-0—16,667 tons. A new grade listed this year is 15-10-10 with 1,725 tons sold.

Controlling Weed Pest Subject for Field Day

SACRAMENTO—Progress in controlling Medusa head on California rangelands will be the major topic discussed at the 1959 Hopland Field Day September 22 at the University of California range research station.

Use of fire, chemicals, grazing and seeding to control this leading range weed pest will be covered on the program.

The Medusa head control work will be shown on an afternoon tour of the station. Methods of converting brush to grass by use of fire, chemicals, seeding and fertilization will also be demonstrated.

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Formula to Fatten your Profits:

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DORSEY BULKMASTER **SELF-UNLOADING TRANSPORT**

Whatever your dry bulk cargo may be, this new Bulkmaster is engineered to *cut delivery time and costs.* So efficient it makes light work of stubborn materials and ruggedly-built with quality features that insure trouble-free operation: Tandem hydraulic pump, powered by 25-hp air-cooled gasoline engine, operates rubber belt conveyor which is riveted to a 36″ heavy-duty steel conveyor chain, and elevators.

The versatile unit pit dumps or can be equipped with 14-foot folding or rigid full-swiveling 18″-wide endless-belt conveyor. Discharge is in excess of a ton per minute. Other outstanding features include:

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OSCAR & PAT

By AL P. NELSON
Croplife Special Writer

When Pat McGillicuddy came to work about 9:30 a.m. Oscar, his partner, was not in the store. Oscar was at the bank, making the daily deposit. He did not trust anyone else to make it; once he got the money into the bank, then he knew it was there, and it quieted his nerves. This depositing of money was a sacred ritual to Oscar; it was a step toward security and inner peace.

But there was one big worry that Oscar had, too. Pat was the spender, and if Oscar did not watch out, he figured, he would have to be coming to the bank for another purpose, namely, to get a loan, to take money out. This latter procedure was as painful to Oscar as the pulling of a tooth.

Pat had been up late the night before at home, for Nora, his wife, and he were painting cardboard signs for a sales promotion which Pat had not yet sprung on Oscar.

Now as Pat approached his desk, he let out a surprised grunt. "For Heaven's Sake, Tillie, what's happened to my desk?"

Tillie smiled, got up from her typing chair and came over and surveyed Pat's desk. Marked copies of trade magazines such as Croplife, Feedstuffs, Farm Store Merchandising and others lay heaped everywhere. The marked articles bore such titles as "Collect Or Go Bankrupt," "Establish a Credit Policy and Stick To It," "Watch Out For Deadbeats." On top of these marked magazines, too, lay a book. The title was "106 Ways To Collect Money."

"You know who did it, don't you?" Tillie smiled.

Pat nodded grimly. "I don't have to guess twice. I wish he'd stop pestering me about credits and collections all the time. He thinks I should be out working on them every day."

"He likes to push credits and collections," Tillie observed, "and you like to push selling. You'd be quite a team, if you ever learned how to pull together, Pat. Why don't you pacify him once in a while? Go out and collect two or three days in a row. Get all the collections in that you can. Maybe that would change Oscar."

"You'll never change that guy, Tillie. Besides, I tried collecting several days in a row. But some farmer would always want something, and then I'd find myself selling instead of collecting. The money comes in eventually. We don't have many bad debts. His hints like this get my Irish up. I don't like to be told what to do—by him!"

Tillie sighed. "Oh, I guess you two will be feuding until one of you sells out to the other or dies." And she went back to her typing.

Pat sat down at his desk and surveyed the heaped up mess of marked magazines and collection books. As he stared a steely look came into his eyes. Finally he got up, began collecting the magazines and books. Then he walked to Oscar's desk and let the whole mess slide down on the orderly surface, the neat row of pencils.

A smile came over Pat's face as he looked at the chaos he had made on Oscar's desk. He started to whistle "My Wild Irish Rose." Then he sat down at his own desk, got a piece of cardboard and began printing letters on it.

Completing this, he continued whistling and surveyed the sign. The copy read, "Business Rule No. 1 . . . Sell or Go Out of Business."

"Pat McGillicuddy!" said Tillie with horror, as she came and viewed what he had done. "I'm going out for a sundae. When Oscar comes back from the bank he will go through the ceiling."

"You mean ceilink, don't you," Pat grinned. "Look, Tillie. He made his point. I've got a right to make mine. The die is cast."

When Oscar came back from the bank he walked very importantly, with a little swing to his hips. The office and store area were empty of people, except Pat who sat with his feet on his desk reading a magazine.

Oscar was so preoccupied with his own thoughts that he did not see the condition of his desk until he was almost ready to sit in his chair. For one moment he stared in frozen horror at the mess. Then he whirled toward Pat.

"You!" he thundered. "You did that!"

Pat looked up, grinning. "I sure did. You put all that stuff on my desk covering up my precious sales promotion material. So I just put it back on your desk where it belongs."

"Himmel, you Irisher! I put that schtuff on collections there for you to read. You neet it!"

"I'm not the man in charge of credit," Pat said. "That's your department. I only go out and try to collect the money."

Oscar was furious. "That's the trouble with you. Ach, you can never get serious about the important things. You couldt readt for six months on credits and collections and still not haf enough in your headt on it."

"Have you ever heard that old expression about the horse, Oscar—you can lead him to water, but you can't make him drink? You can't make me read that stuff, just because you think I should. You can't shove that down my throat. Remember, I'm independent. I'm Irish, begorra."

Oscar glared at his partner. "Ach, and I'm Deutsch. I can schtick to my point."

"You don't have to tell me that. Why don't you use the right word—you're stubborn as a mule?"

Oscar's face got redder. "I like being stubborn. I know I'm right, and you're wrong. I know more about this business than you do."

"About some phases—yes. About other phases, I know more. Just let that sink into your thick skull."

Red Cochran, one of the store's employees, opened the door from the warehouse, quickly closed it again.

Pat looked steadily at Oscar's statue-like, stern face, with lights gleaming from the grey eyes.

"Oscar," he said, "I will make a bargain with you. I will read this book on 106 ways to collect money, and five of your marked articles in magazines on collections—if—and I'll bet you'll say no—if you read a book on sales promotion which I select for you, plus five articles on sales promotion in Feedstuffs, or Croplife, Farm Store Merchandising or some other magazines. Fair enough, isn't it?"

Oscar blinked. He swallowed hard. A look of pain swept over his face. And yet, as he looked at the credit and collection material on his desk, saw the list of delinquent accounts peeking out from under some magazines, he hesitated.

"Ach," he said with effort, "I will do it, chust to get you to readt how important collections are. I will go through your sales promotion junk, but I will not change my mindt. I will think chust as I do now, because I know I am right."

Accidental 'Find' Leads to Grant

An accidental discovery of a new form of nitrogen in the soil has led to a special research grant for University of Illinois soil scientist Frank J. Stevenson.

The National Science Foundation awarded $19,250 to Mr. Stevenson to be used during the next two years for basic research in the nitrogen composition of various rock formations.

For several years Mr. Stevenson has been studying the chemical composition of various forms of nitrogen in the soil. It was only by accident that he found this new form of nitrogen—a form of ammonium locked into the lattice-like structure of the clay particles in the soil. The amount of this form appears to be greater than the total of all other mineral forms.

Mr. Stevenson emphasizes that the nitrogen in the surface soil occurs in organic matter.

This discovery, of particular interest to soil scientists, geologists and other scientists, reveals that a vast reservoir of nitrogen exists in the terrestrial areas of the earth as ammonium ions held within the lattice structure of silicate minerals, including those in rock materials.

This discovery also provides a clue to the origin of nitrogen in the atmosphere. The nitrogen in the air is believed to have originated from nitrogen in rocks and been released as a gas during periods of intensive volcanic activity. It also provides an explanation of the chemical nature of the nitrogen in stony meteorites.

FARM SERVICE DATA

EXTENSION SERVICE REPORTS

Soybean growers can lose up to $20 or $30 an acre by improper placement of fertilizer, according to research findings by the Ohio experiment station.

Poor stands and 10 to 15 fewer bushels were produced an acre when fertilizer was placed one inch directly below the seed or as close as half an inch from the seed. In some fields as much as half of the beans never came up.

H. J. Mederski, agronomist of the Ohio Station says soybean seeds cannot absorb enough water for normal germination when the fertilizer is too close to the seed. Of four methods of soybean fertilization tested by Ohio researchers, they found that best bean yields and stands can be expected when fertilizer is placed about 1½ inches to the side and 1½ inches below the seed.

The soybeans in the Ohio tests were fertilized at the rate of 200 and 400 pounds of 0-20-20 per acre, but even at the lower rate of application, damage to plants was severe when the fertilizer was improperly placed.

★

Good farming management that cuts costs of crop production, boosts yields and increases profits per acre, involves setting up realistic crop production goals for the different soils on your farm, according to Dr. Marvin Beatty, University of Wisconsin soils specialist.

"When you have figured out the yields you think are possible," says Dr. Beatty, "you need to put on the plant food it takes to get those yields.

"This, of course, calls for a soil test to determine what the plant nutrient needs are."

Good management, says Dr. Beatty, also involves the use of well-adapted seed varieties; timely seedbed preparation; improved cultural practices; effective weed and insect control.

"Then, of course, the weather has to cooperate," he adds. "Any production goal program should consider a period of years. You have to take the good years and the bad ones into account. You have to average them out to know whether or not you are meeting your goals."

Dr. Beatty said that every farmer knows where his good fields are and where the less productive ones are. The differences in soil are due to texture, depth, drainage, amount of sand or clay in the soil; and the soil's organic matter supply. These factors help determine how much crop a soil will produce—why some soils give big yields and why others produce smaller ones.

"Farmers can get effective information from their county agents, from soil conservationists assisting their soil conservation districts, and from vocational agriculture teachers on how to push yields on good soils up to higher yields and also how to make the best use of less productive soils," says Dr. Beatty.

"A 'Crop Production Potentials' program has been launched in several Midwestern states through the cooperation of agricultural college soils specialists and the midwest division of the National Plant Food Institute.

"In this program, wall charts and localized check lists have been distributed to county agents, soil conservationists and vocational agriculture teachers and to many fertilizer dealers. The wall charts include maps showing the principal soil areas of each state, plus information on the potential crop yields in each area and the management methods needed to achieve them. The localized check lists give farmers in a particular area specific facts on the soil types in their area and the crops suited to their soil."

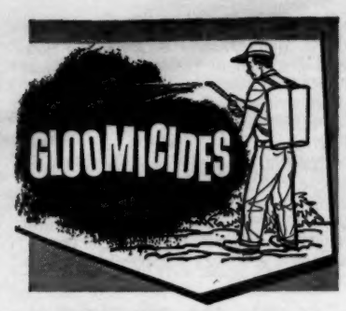
★

Many Nebraska soils are "fertilizer-hungry" because crops are eating up nutrients faster than farmers are returning them to the soil in plant food form, a University of Nebraska expert said recently.

Clinton A. Hoover, extension soils specialist at the college of agriculture, noted that farmers are still applying less than ⅓ the amount of phosphate fertilizer they could use profitably.

"This is despite a 39% increase in fertilizer use that brought total fertilizer consumption in Nebraska to 232,000 tons last year," Mr. Hoover commented.

Soil tests show that farmers in the Cornhusker State could profitably use 150,000 tons of available phosphorus per year, but less than 18,000 tons were applied in 1958. Tests also showed a need for 10 times more limestone than was used, he added.



In these days of wonder drugs, the common cold still defies medical research. Suffering from a severe cold, the patient begged the doctor to cure it for him quickly. But the doctor had only one suggestion, and a strange one it was. He told the man to go out into a cold winter rain with inadequate clothes and allow himself to be soaked through.

"But, Doctor," exclaimed the puzzled patient. "That would give me pneumonia, wouldn't it?"

"Exactly," answered the doctor. "We can cure pneumonia with penicillin in no time, but for a cold—nothing!"

★

A new farm hand from the city was told to harness a mule one winter morning in the early hours. In the dark he tackled a cow instead of the mule. The farmer shouted from the house, "Say there, what's keeping you so long?"

"I can't get the collar over the mule's head," shouted the new man. "Both his ears are frozen solid."

★

A neighbor went over to a young newlywed's house and found her in tears. "Why, what's wrong, Marge?" she asked.

"I made a cake and put it in the refrigerator and there isn't any frosting on it yet," she replied.

★

In the championship match of the marble tournament, one little boy missed an easy shot and let slip with a real cuss word.

"George!" called the preacher from the sidelines, "what do little boys who swear when they are playing marbles turn into?"

"Golfers," came the prompt reply.

★

Two young fellows were walking down the street one pitch black night. One of the boys had a flashlight with him, and he pointed it upwards and turned on the switch. A brilliant beam of light resulted. He turned to the other boy and said: "I'll give you a dollar if you can climb all the way up that beam."

The second boy hesitated for a minute and then refused. "I know you, Jim," he objected. "I'd get half way up, and you'd flick off the switch."

★

The salesman gasped when the gorgeous blonde opened the door. "Madam," he gulped, "may I see your husband?" Said the beautiful blonde: "Oh, he's gone to Hawaii and won't be back for six weeks." "Then," said the salesman, "may I come in and wait?"

★

A man and his small son were standing in front of a lion's cage at the zoo.

Suddenly the little tyke asked: "Daddy, if that lion gets out of his cage and eats you up, what bus should I take home?"

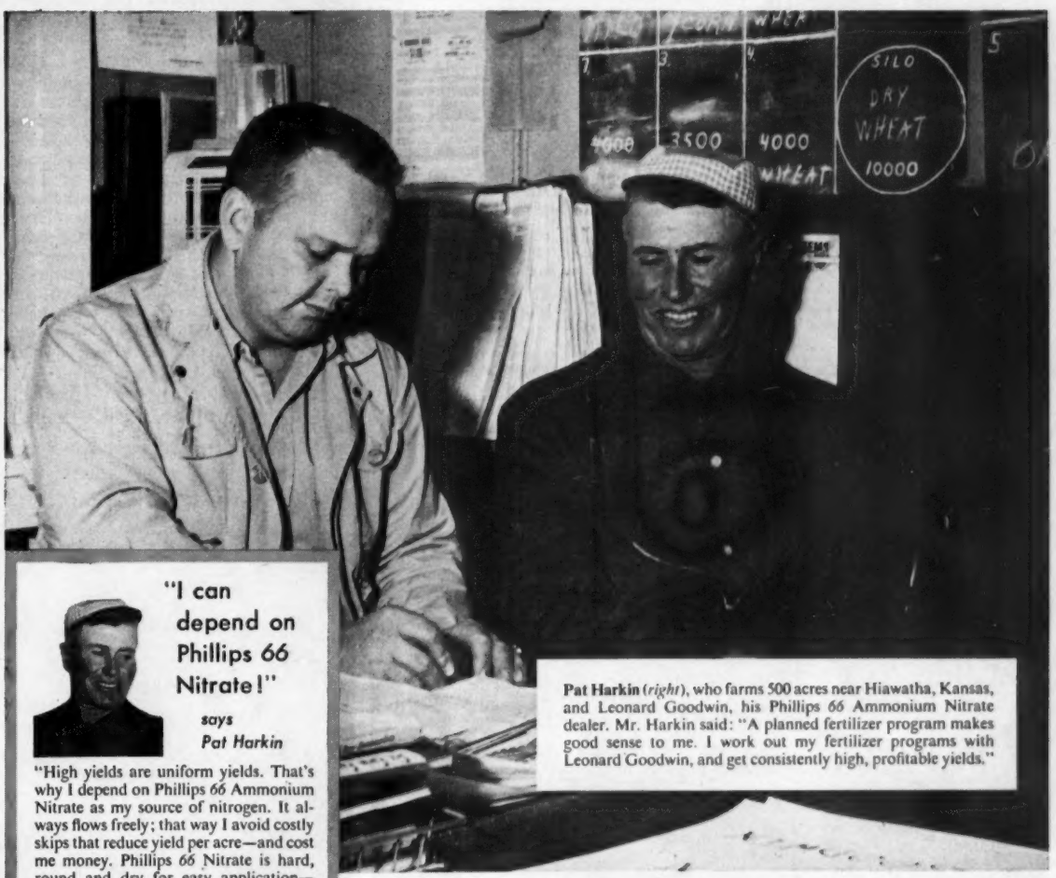
★

Co-ed: "Daddy, the girl who sits next to me in class has a dress just like mine."

Dad: "So you want a new dress?"

Co-ed: "Well, it would be cheaper than changing colleges."

PHILLIPS 66 ads like this appear regularly in CAPPER'S FARMER, PROGRESSIVE FARMER, FARM JOURNAL, FARMER-STOCKMAN and FARM and RANCH . . . part of a continuing program to help dealers sell more mixed fertilizers and PHILLIPS 66 AMMONIUM NITRATE.



Pat Harkin (*right*), who farms 500 acres near Hiawatha, Kansas, and Leonard Goodwin, his Phillips 66 Ammonium Nitrate dealer. Mr. Harkin said: "A planned fertilizer program makes good sense to me. I work out my fertilizer programs with Leonard Goodwin, and get consistently high, profitable yields."

"I can depend on Phillips 66 Nitrate!"

says Pat Harkin

"High yields are uniform yields. That's why I depend on Phillips 66 Ammonium Nitrate as my source of nitrogen. It always flows freely; that way I avoid costly skips that reduce yield per acre—and cost me money. Phillips 66 Nitrate is hard, round and dry for easy application—stores well, too."

Both products shown 2 times actual size

New Phillips 66 Ammonium Nitrate — *Ordinary Ammonium Nitrate*

Proof of the difference in these unretouched photographs. And this difference will pay off for you—when you apply Phillips 66 Ammonium Nitrate. You get round, hard, dry and uniform prills that *stay that way* in storage and during application. This means uniform distribution, so that you avoid costly skips that cut your yield per acre. It will *pay* you to ask for Phillips 66 Ammonium Nitrate, with 33.5% nitrogen.

Planned fertilizer program helps him maintain higher yields

Mr. Harkin said: "Both my wheat and corn yields have been substantially improved through the use of fertilizer. Of course, I try to follow other good agricultural practices—but it's the fertilizer that makes all these practices pay off.

"On wheat, I have averaged 40 bushels since starting a program of 13-39-0 applied pre-plant and Phillips 66 Ammonium Nitrate applied as a top dressing. On corn, my average yield is around 85 bushels per acre. I use 13-39-0 and 300 pounds of Phillips 66 Ammonium Nitrate plowed down on my corn.

"Like any other farmer, I'm in the business to make money. That's why my fertilizer programs always include Phillips 66 Ammonium Nitrate."

For your fertilizer requirements, it will pay you to depend on the combination of Phillips 66 Ammonium Nitrate . . . and the friendly assistance of your fertilizer dealer. See him today about a *planned fertilizer program*—using Phillips 66 Ammonium Nitrate and his high quality mixed grades.

"A good name PHILLIPS 66 *to grow by"*

PHILLIPS PETROLEUM COMPANY. Sales Offices: Amarillo, Tex.—First Nat'l Bank Bldg. • Atlanta, Ga.—1428 West Peachtree Street, Station "C" P. O. Box 7313 • Bartlesville, Okla.—Adams Bldg. • Chicago, Ill.—7 South Dearborn St. • Denver, Colo.—1375 Kearney St. • Des Moines, Iowa—6th Floor, Hubbell Bldg. • Houston, Tex.—6910 Fannin Street • Indianapolis, Ind.—3839 Meadows Drive • Kansas City, Mo.—201 E. Armour Blvd. • Minneapolis, Minn.—215 So. 11th St. • New York, N. Y.—80 Broadway • Omaha, Neb.—3212 Dodge St. • Pasadena, Calif.—317 North Lake Ave. • Raleigh, N. C.—401 Oberlin Road • Salt Lake City, Utah—68 South Main • Spokane, Wash.—521 East Sprague • St. Louis, Mo.—4251 Lindell Blvd. • Tampa, Fla.—3737 Neptune St. • Tulsa, Okla.—1708 Utica Square • Wichita, Kan.—501 KFH Building.

OHIO OPERATION

(Continued from page 9)

effective. However, he states, tests have shown that liquid fertilizer produces competitively, is easy to handle and is speedy to apply. Flo-lizer dealers are even spreading a lot of liquid fertilizer when the ground is frozen in fall.

Mr. Godden reports that there is a growing tendency in his part of Ohio to use liquid fertilizers for plowdown for corn lands in fall. Quite a few farmers, too, are replacing old type planters with new planters with liquid fertilizer attachments.

To help farmers in applicating fertilizer, this company has a number of aids available to customers. Through Flo-lizer the farmer can get a custom applicator to handle the job, he can rent equipment from Flo-lizer to do the job, or he can buy his own applicating equipment.

During the past year, Flo-lizer made arrangements with a small machine shop to manufacture an applicator with all iron parts. The machine sells for $350. The farmer can use this applicator for applying liquid fertilizer, and it can also be used to spray for weeds, to spray livestock, barns, etc. It is an all purpose sprayer.

Flo-lizer has a truck mounted sprayer which they like to use for their own spray work. Applicating charges run about $5 ton. A unit can spray about 20 acres an hour.

To facilitate the distribution of liquid fertilizer through a 20 county area, Flo-lizer has bulk plants at Hebron and Wakefield, Ohio, and also 10 dealer bulk stations. At Kingston, the main plant, there is about 22,000 pounds liquid storage.

There are 13 liquid fertilizer plants in Ohio, reports Mr. Godden, and there were only two others when Flo-lizer started in business several years ago. The manufacturers have formed the Ohio Manufacturers of Liquid Fertilizers Assn., of which Henry Troyer, Plain City, Ohio, is president.

Godden and Humphrey do considerable dealer and customer educational work. During last year they spoke to 1,800 farmers, 30 at a time. They like to hold small meetings at dealers' salesrooms, or at country halls, etc. At small meetings, Mr. Godden states, farmers are more likely to ask questions.

In addition to holding meetings for dealers, Flo-lizer, Inc., holds from 10-15 regional meetings of its own.

"We do a great deal of field demonstration work, using test plots," reports Mr. Godden, "as we find this is an excellent way to sell fertilizer. We work with individual farmers taking into account the types of soil and the crop history, etc. That is why soil testing and soil mapping play an important part in our service program."

Local soil in the Kingston area is high in potash. Therefore, analyses fertilizer for corn go something like this, 12-12-4, wheat calls for 6-18-6, other grains 6-18-6, pasture 8-8-8, bluegrass straight nitrogen, etc.

Quite a few of Flo-lizer's customers follow soil recommendations rather closely. Some use 400 to 500 lbs. of fertilizer on corn land. Several put as high as 1,000 lbs. on wheat and have doubled their yield.

"We keep a close check on high yields on customers' crops," says Mr. Godden, "so that we can tell others what proper fertilization will do. We have our own farm and we're constantly testing fertilizers on it. This certainly has proved to be a good sales point for us. We buy new wheat seed from Purdue university, for example, and test it on our farm. Many of our customers know of these activities and come to see our crops."

Flo-lizer, Mr. Godden states, is now set up to add boron to fertilizer to top dress alfalfa, and can use boron in all analyses of fertilizer if customers wish it. The firm also adds aldrin and heptachlor to some types of fertilizer.

Tests on corn which Flo-lizer has made, reports Mr. Godden, indicate that farmers can use more corn plants per acre than previously. Last year the firm tested two fields of corn on their farm, using the same amounts of fertilizer. One field has 20,000 plants an acre, and the other had 16,000 plants. The 20,000 plant field yielded 35 bushels more to the acre. Mr. Godden says that from 15,000 to 20,000 plants per acre are needed to produce 100 and more bushels an acre in this part of Ohio.

Realizing the importance of crop production loans, Flo-lizer has contacted many bankers throughout its 20 county area, urging them to consider fertilizer loans to farmers. As a result of this and other educational means, many country bankers are now more liberal in fertilizer loan policies. For instance, many bankers now realize the value of good pasture land and will give loans for fertilizing it. One banker was willing to finance a three year loan for lime and fertilizer on a three year test basis for a well rated farmer. Mr. Godden and Mr. Humphrey helped to set up this trial deal.

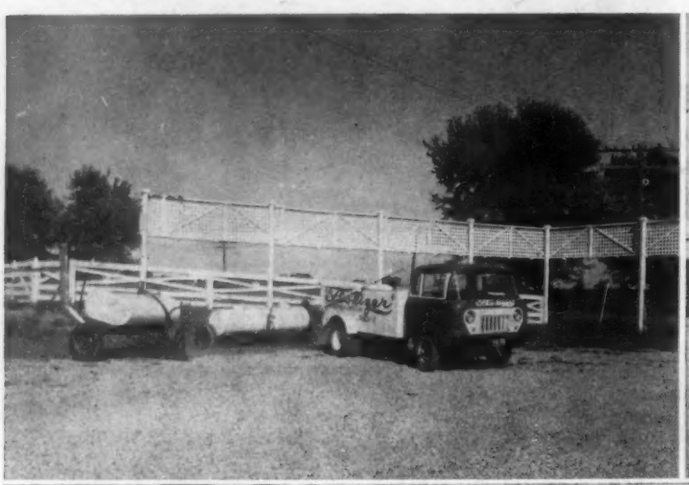
Many banks in the area, Mr. Godden states, now have field men who call on farmers to discuss loans with them. Bankers and farmers are now realizing that more land is not always needed to raise more cattle, etc., when more grass can be grown on present land holdings through proper fertilization.

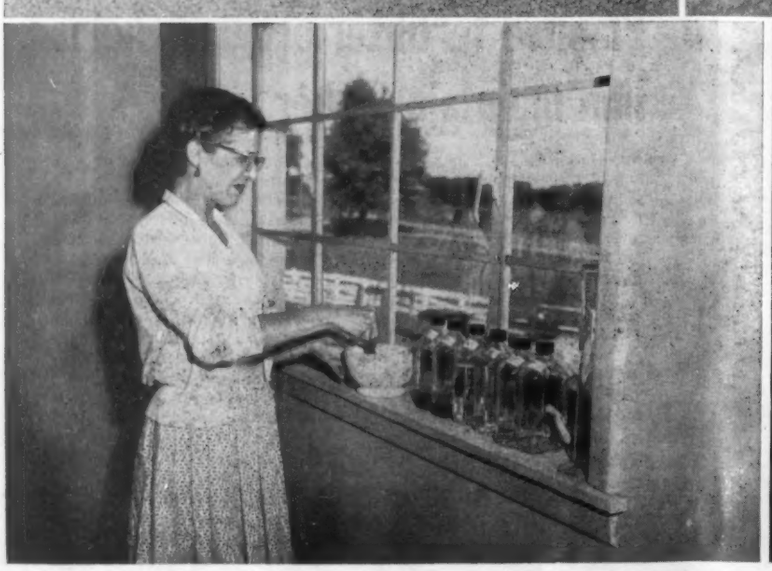
"The interest and activity of bankers in the fertilizer field certainly is going to help both farmers and fertilizer dealers," says Mr. Godden, "and it will bring more business for banks, too. We are very happy to see this trend develop."

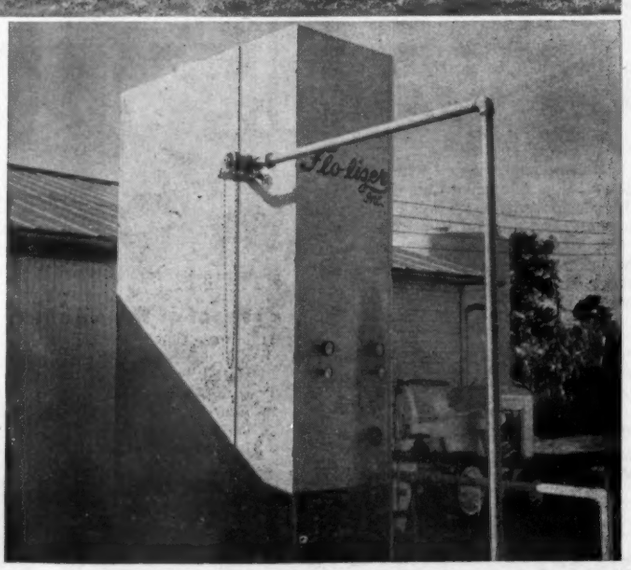
As banks show more interest in crop production loans, states Mr. Godden, the fertilizer dealer's collection problem is eased. When a farmer wants a fertilizer loan today, the dealer can often refer the customer to a bank, instead of being forced to carry the loan himself.

Flo-lizer, Inc., sends out a monthly bulletin to all dealers and customers. It is titled "Flo-lizer Drip Sheet." The publication contains fertilizer information in easy to read form, and customers like it. One short item in a recent bulletin called attention to the Fall Plow Down season.

The copy said, "Fall plow down of Flo-lizer is the key to big, profitable corn crops. To raise 100 bushels of corn, many things are involved. Without a doubt, fertilizer is one of the most important. The soil must supply 160 lbs. nitrogen, 60 lbs. phosphate, and 125 lbs. potash for 100 bu. yields. This is where we hit a snag. Most soils in this section are not capable of producing 100 bu. corn without added plant food. In order to determine what your soil needs to produce high yields, it is quite advisable to take a soil test. Your Flo-lizer dealer will be glad to supply you with this service at no charge or obligation and then recommend the amount and







FACILITIES HELP SALES—Views of Flo-lizer, Inc., equipment, buildings and other facilities which all add up to extra service, more volume and better profits. Top row shows supply tanks displayed out-of-doors in parking lot at firm's new headquarters at Kingston, Ohio. Next is new office and headquarters of firm at Kingston. In the lower row is an assistant at work in the firm's soil-testing laboratory, one of the key business-getting functions of the company. The other shot shows part of the Flo-lizer plant at Kingston.

analysis best suited to your soil..."

Flo-lizer also issues mimeographed reports on the various fertilization experiments it conducts on its own and also on customers' farms. Educational work like this impresses customers and causes many of them to fertilize more closely with soil test recommendations, reports Mr. Godden.

The fertilizer firm has also issued a chart for corn plant population figures on 36 in., 38 in., 40 in., 42 in. and 60 in. row widths. This chart is valued by many farmers who can see exactly what chances they have to grow 100 bu. an acre of corn according to plant population and proper fertilization.

Soybean Cyst Nematode Regulated Area Extended in Virginia

WASHINGTON — Two localized areas of approximately 20 farms each plus 24 individual farms in Nansemond County, Va., found infested with the soybean cyst nematode, have been added to the area regulated because of this pest, under a U.S. Department of Agriculture order effective Aug. 21, 1959.

A public hearing to consider this action was held in Richmond, Va., July 8.

One of the sizeable regulated areas in Nansemond County comprises approximately 2.5 square miles in the southeast corner of the county just west of the Dismal Swamp. The other localized area includes about 3.4 square miles adjoining the county line in the western part of the county. The 24 individual farms are scattered in the southern third of the county.

At the same time minor additions are being made to the regulated areas in Arkansas, Kentucky, North Carolina and Tennessee.

Fertilizer Use Sets New Records in California

SACRAMENTO — The California Department of Agriculture reports that 485,672 tons of commercial fertilizers and 170,204 tons of agricultural minerals were sold during the second quarter of 1959.

Record highs for the 1958-59 fiscal year were established with 1,255,899 tons of commercial fertilizers sold and 1,079,313 tons of agricultural minerals, the report added. Commercial fertilizers were up 11.5% and agricultural minerals were up 31.6% over 1957-58.

Robert Z. Rollins, chief of the Department's Bureau of Chemistry, said that comparison of the tonnages reported for the recent quarter with those for a similar quarter in 1958 showed marked increases in anhydrous ammonia, ammonia solutions and ammonium sulphate.

Mr. Rollins also said that liquid products have been steadily increasing in popularity with California farmers. During the second quarter of this year liquid products made up 47% of the total tonnage of commercial fertilizers. Ammonia solution 20-0-0 grade alone accounted for 183,000 tons during the quarter.

Gypsum continued to be the major agricultural mineral and made up 91% of the total of 485,259 tons of these materials reported.

POPULAR HANDBOOK

NEW HAVEN, CONN. — Demand for the 200-page Plant Pest Handbook has made necessary a second printing of the $1 a copy bulletin of the Connecticut Agricultural Experiment Station. Nearly 4,000 copies of the handbook have been purchased since distribution began in 1957. The handbook brings together information on pests and related injuries that occur on flowers, fruits, ground covers, shrubs, tobacco, meadows, small grains and vegetables. Included are pests of 223 host plants, from abutilon to zinnia, arranged for quick reference.

Idaho Seed Growers Suffer $30,000 Losses From Weedy Fields, Agronomist Estimates

MOSCOW, IDAHO—At least $30,000 last year was lost to Idaho seed growers because of weeds, and most of the loss could have been prevented, according to Robert Higgins, agronomist of the University of Idaho extension service.

A report by the Idaho crop improvement association Aug. 22 showed that 2,600 acres of seed crops were rejected in 1958 because of weeds. More than 3% of the total acreage planted for seed certification was turned down. The figure is based on production of alfalfa, red clover, grasses, grains and beans. (It does not include potato seed.)

Mr. Higgins said a consistent control program would have eliminated most of these weeds. Selective spraying in grain crops can control broadleaved annuals and perennial weeds, and will remove problem weeds from other seed crops, he pointed out.

Weeds caused rejection of 20 fields of red clover seed, one of Idaho's finer crops. Slightly more than 16,000 acres were entered for certification. Weeds spoiled 400 acres. Main weeds were dodder, which infested 250 acres; buckhorn and yellow trefoil.

Canada thistle and quack grass were largely responsible for rejection of 462 of 6,700 acres of grasses.

Of 18,900 acres offered for certification of grain, 1,300 were rejected, most'y because of wild oats. Of 23,000 acres of beans, 24 fields of 300 acres were rejected.

Northern Leaf Blight Hits Wisconsin Corn

MADISON, WIS. — Northern leaf blight infection in corn could reach epidemic proportions in some Wisconsin areas this year, according to Earl Wade, University of Wisconsin plant disease specialist.

Mr. Wade said the infection first appears as leaf spots from one-half to three or more inches long and oval or "boat" shaped. The spots, becoming tan to tan-green, run parallel to the veining and enlarge rapidly and become oblong when the weather is warm and moist.

The lower leaves are usually attacked first, Mr. Wade said, and are the first to dry up. The infection rapidly spreads to the upper leaves, and heavily affected fields then look as though they had been injured by frost. When the corn dries up, it becomes more susceptible to stalk rot.

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BUG OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board

Cotton Flea-hopper

How to Identify

The adult fleahopper is about ⅛ in. long, flattened, elongate ovate in outline, with prominent antennae. The body is pale yellowish-green in color with minute black hairs and black specks over the upper surface. Its distribution is general throughout the cotton belt and over much of the U.S.

Habits of the Fleahopper

This pest hibernates in the egg stage on various weeds. In southern Texas, it has appeared on horsemint early in March, migrated to cotton late in April, and deserted the cotton by the end of July to feed for the remainder of the season on other plants, including snap beans and potatoes. Eggs are yellowish white, about 1/30th in. long and a fourth as wide. They are inserted beneath the bark, especially just below the growing tips. They hatch in just a little over a week and the greenish nymphs begin sucking the sap from terminal bud clusters. Nymphs molt five times and in from 10 to 30 days, are mature bugs.

Damage Done by Fleahopper

This bug has caused serious damage to cotton in scattered areas throughout the south, by sucking the sap from the very small squares and other terminal growth, resulting in excessive shedding and an abnormal whip-like growth of the plants.

Control of Fleahopper

Recommendations for control materials, timing, application practices, dosages, etc., may vary widely in different states and sections of the country. It is therefore difficult here to attempt to give specific suggestions as to what materials should be used or how they should be applied. Local authorities such as county agents, state experiment station entomologists, and manufacturers of the various pesticides should be consulted for specific information. Labels on pesticide containers carry full instructions on use and dosages. Users should always be urged to study labels carefully before applying any insecticide on food or feed crops to avoid the risk of illegal residues at harvest time. Cultural methods of control include the eradication of weeds and the destruction of cotton stalks during the fall and winter, thus eliminating the environment for next season's population of fleahoppers.

Drawing of fleahoppers furnished Croplife through courtesy of Hercules Powder Co., Wilmington, Del.

Sales in the States

Missouri

COLUMBIA, MO.—Fertilizer consumption for the 1958-59 fiscal year totaled 933,090 tons, the department of agriculture has announced. Of this 533,830 tons comprised mixed goods. The total use for the 1957-58 year was 755,927 tons, of which 404,315 tons were mixed goods.

Straight materials showed gains in many categories. Anhydrous ammonia climbed 34.2% over last year's total, with a figure of 28,871 tons for the current year compared to 21,508 for the 1957-58 year. Nitrogen solutions also increased. Total for 1958-59 was 17,817 tons compared to 12,996 tons last year. This increase was 37.1%. Percentagewise, urea scored the greatest advance, 114.9%, but this was based on low tonnage figures, 481 tons against 224 tons. Total nitrogen used was up 23.2%, rising from 104,209 tons last year to 128,411 tons in 1958-59.

Oklahoma

OKLAHOMA CITY, OKLA.—Fertilizer sales in Oklahoma for the fiscal year ending June 30, 1959, amounted to 133,586 tons, reported Jack M. Cornelius, Jr., president, State Board of Agriculture, and Parks A. Yeats, director, Seed, Feed & Fertilizer Division.

Virginia

RICHMOND, VA.—There were 779,143 tons of fertilizer sold in Virginia during the fiscal year June 30, 1958 through June 30, 1959, reported the Division of Chemistry & Foods, Virginia Department of Agriculture.

This amounted to 684,509 tons of mixed goods and 94,634 tons of materials.

During the similar period last year, 690,556 tons of fertilizer were sold.

Arkansas

LITTLE ROCK, ARK.—The Arkansas State Plant Board reports that 353,457 tons of fertilizer were sold during the fiscal year July 1, 1958 through June 30, 1959 as compared with 289,641 for the previous year.

Of the 1959 total, 189,155 tons were materials and 164,302 were mixed grades.

North Carolina

RALEIGH, N.C.—L. Y. Ballentine, commissioner of the North Carolina Department of Agriculture, reports that 1,696,759 tons of fertilizer were shipped in North Carolina during the fiscal year July, 1958-June, 1959. This is 235,628 tons more than the previous fiscal year.

South Carolina

CLEMSON, S.C.—Fertilizer sales in South Carolina during July, 1959 amounted to 12,632 tons or 30% less than sales for the same month a year ago, reported B. D. Cloaninger, director of the Fertilizer Inspection & Analysis Department, Clemson College School of Agriculture.

West Virginia

CHARLESTON, W.VA. — Reported sales of commercial fertilizer to farmers and other users in West Virginia for the first six months of 1959 amounted to 60,397 tons, announced J. T. Johnson, commissioner of agriculture. This was an increase of more than 1,000 tons over the similar period in 1958.

Notable increases were made in the sales of 5-10-10 and 20% superphosphate, Mr. Johnson said.

Minnesota

ST. PAUL, MINN.—An increase of nearly 100,000 tons of fertilizer was reported by the Minnesota department of agriculture for the fertilizer year of July 1, 1958, to July 1, 1959. The tonnage for the 1959 season was 541,534 tons as compared to 443,389 tons the previous year. Of this total, 419,964 tons were mixed fertilizers and 121,750 tons of materials.

The most-used grade of mixed fertilizer was 0-10-30, accounting for 33,950 tons. Nitrogen solutions, ammonium nitrate and concentrated superphosphates accounted for the most tonnage in straight materials, with 29,649, 24,182, and 20,583 tons, respectively. Anhydrous ammonia was consumed in the amount of 18,761 tons.

The 541,534 tons includes 3,033 tons of fertilizer-pesticide mixtures and 24,786 tons of liquid fertilizer mixtures.

North Dakota

BISMARCK, N.D.—North Dakota fertilizer sales for the first six months of this year amounted to 99,001 tons, reported L. A. Koehler, state food commissioner and chemist, State Laboratories Department.

This broke down into 16,739 tons of mixed fertilizers and 82,262 tons of fertilizer materials.

READER VIEWS

To the Editor:

I read in your August 17 edition of Croplife that ammonium nitrate did not cause the Oregon explosion and this interested me a great deal. I regret that you play up the statement that it was not the cause and completely forgot that it was the probable explosive fuel that extended the scope of the explosion.

In your article it was stated that ". . . fertilizer grade ammonium nitrate alone is not an explosive. It will not explode unless mixed with an organic substance such as oil."

The fertilizer grade ammonium nitrate might be a poorer explosive than a higher grade ammonium nitrate, but just because it is a lower grade does not make it non-explosive. Reports have stated that it was fertilizer grade ammonium nitrate that was involved in the Texas City disaster. Fertilizer grade ammonium nitrate does not need to be mixed with an organic substance such as oil to became an explosive.

The oil is used to create a more homogeneous explosive and without it the efficiency of the explosive is curtailed a slight amount.

Mill Mutual Fire Prevention Bureau
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H. C. Schuler, Engineer

30-YEAR AWARD

RICHMOND, CAL. — The first woman to receive a 30-year award for service at California Spray-Chemical Corp. is Mrs. Winnie Nelson who was presented a gold watch and matching bracelet at a recent luncheon in her honor. The presentation was made by A. W. Mohr, president of the corporation.

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SCHOLARSHIP PROGRAM—Ralph B. Douglass, chairman of the board of Smith-Douglass Co., Inc., congratulates J. Allen Kimball, Jr., Manson, N.C. upon the latter's completion of his freshman year at North Carolina State. Young Mr. Kimball is typical of scholarship-winning students helped by S-D in the program now in its fifth year. Recipients of the scholarships are selected by 4-H clubs, Future Farmers of America, or college officials who review the progress of students periodically. The program has now helped 209 students. A high percentage of these have indicated a desire either to farm or to help others by teaching agriculture. Others have said they want to do research or technical work associated with agriculture. Since the scholarship program was begun in 1954, some $192,000 has been used or reserved for present scholarships, S-D reports.

Dean R. Gidney Resigns From U.S. Potash Co.

Dean R. Gidney has resigned from the United States Borax & Chemical Corp., according to an announcement by James M. Gerstley, president. Mr. Gidney served as vice president and general manager of the United States Potash Co. division of United States Borax since 1956. He had been vice president and sales manager of United States Potash prior to its merger with Pacific Coast Borax Co. in 1956 to form United States Borax & Chemical Corp.

Mr. Gidney's resignation, effective Sept. 30, followed the company's realignment in which the division system was abandoned in favor of five functional departments.

In expressing regret at the loss of Mr. Gidney's services, Mr. Gerstley said the change in the management structure provided for only one top echelon sales and marketing position. Appointed to this post was J. F. Corkill, who had joined the company some years earlier than had Mr. Gidney. Mr. Corkill was vice president and general manager of the Pacific Coast Borax division prior to the realignment.

Mr. Gidney was first employed by U.S. Potash Co. in July of 1937, shortly following his graduation from Dartmouth College. During World War II he served in the United States Navy and returned to U. S. Potash as a salesman upon his release from military service with the rank of lieutenant commander.

One year later he was promoted to assistant sales manager and was advanced to the post of sales manager on Sept. 1, 1950. On Feb. 1, 1951, he was named manager of the sales department, the position he held until being appointed a member of the board and vice president in charge of sales on Aug. 1, 1952.

When U.S. Potash Co. merged with Pacific Coast Borax Co. on July 1, 1956, he was named vice president and general manager of the potash division and elected to the board of directors of the new corporation. He has also served as a director of the American Potash Institute, the National Plant Food Institute and the Potash Export Assn.

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Fire Damages Fertilizer Facility in Texas

HENDERSON, TEXAS—Fire recently damaged the Consumers fertilizer plant here. The fire started in a bin containing 200 tons of nitrogen fertilizer and firemen poured water on the smouldering material for two hours.

George McQuire, president of the firm, said that the plant would suspend operations for at least two weeks in order to repair the damage and arrange for replacements for machinery.

A number of firemen were overcome by smoke while fighting the fire.

RESEARCH CENTER DIRECTOR

ST. LOUIS, MO.—Dr. Wendell P. Metzner has been appointed administrative director of the new research center of Monsanto Chemical Company to be constructed here. He will direct all supporting activities and services connected with the operation of the center.

Dr. Metzner will assume his new position immediately in order to take part in the planning of the facilities of the center and to serve as advisor to and coordinator between the divisions concerned. He will report to E. W. Dwyer, director of the company's personnel relations department.

The new appointee was formerly an associate director of research in Monsanto's organic chemicals division.

Delaware Chemical Workers Increase During July

WILMINGTON, DEL. — An increase of 400 workers in chemical manufacturing in Delaware was reported during July. The employment level was estimated at 26,500, compared to 26,100 in June and 25,900 in May, according to the monthly report of the Delaware Unemployment Compensation Commission.

Despite the employment gain, the number of workers in the chemical industry is still 500 less than July a year ago when 27,000 were employed.

Average weekly earnings of the production worker increased between June and July from $128.21 to $133.34. A gain was noted in average hourly earnings, $3.13 in July and $3.06 in June. An increase was noted in the work week, 42.6 hours in July and 41.9 in June.

Hugo Riemer

J. F. Corkill

Functional Departments Replace Divisions In Realignment of U.S. Borax & Chemical

NEW YORK—United States Borax & Chemical Corp. announced on Sept. 1 plans for a realignment of its management structure. Key feature of the program is the establishment of five functional departments to replace the divisional organization based on product lines. U.S. Borax has been operating U.S. Potash Co., Pacific Coast Borax Co., and 20 Mule Team Products as divisions since the formation of the parent company by merger in 1956.

James M. Gerstley, president, stated the realignment has been discussed with the board of directors which will formally implement the new plan of organization on Sept. 23. Mr. Gerstley said the change, occurring at a time when the company is experiencing record-high sales, is expected to further enhance the effectiveness of management.

U.S. Borax reported 19% increase in sales and 213% increase in profits for the nine months ended June 30.

James M. Gerstley

The new corporate structure, the president stated, includes five vice presidents who will serve under Hugo Riemer, executive vice president. They are J. F. Corkill, former vice president and general manager of the Pacific Coast Borax Division, who will be in charge of industrial and agricultural marketing; R. T. Edgar, former vice president for production in the Pacific Coast Borax Division, who will be in charge of production of all company products; D. V. Parker, who will continue in charge of 20 Mule Team Products marketing; R. F. Steel, former vice president in charge of finance and administration, who will become treasurer and head the administrative department; and Dr. D. S. Taylor, former vice president and general manager of the U.S. Borax Research Corp., who will head the technical department. W. A. Ackerman will continue as secretary of the corporation.

Mr. Gerstley noted that U.S. Borax technical, engineering and certain administrative personnel had been operating as unified groups for some time.

The company operates refineries and mining operations at Boron, Cal., and Carlsbad, N.M., with processing plants at Wilmington, Cal., and Burlington, Iowa. The U.S. Borax Research Corp. of Anaheim, Cal., is a subsidiary.

U.S. Borax & Chemical Corp., incorporated in Nevada, currently has more than 5,000 common-share holders of record. Its 4,186,925 shares of common stock and 144,895 shares of preferred stock are listed for trading on the New York Stock Exchange. Of the more than 2,100 holders of preferred stock of record, two-thirds also own shares of common.

Plans for New Center to Consolidate All Research Activity Announced by Monsanto

ST. LOUIS—Plans to develop a research center at the general offices of the Monsanto Chemical Co. in Creve Coeur, Mo., have been announced by Charles Allen Thomas, Monsanto president.

In the initial phase, a building complex occupying about 400,000 square feet of total area, and consisting of two laboratories and supporting facilities, such as analytical laboratories, a library, glass-blowing facilities and other services, will be constructed. Utilities and other special services will be provided from two separate structures. It is hoped to have all buildings completed in 1961.

The center will house only laboratory and related activities similar to those already being conducted at the site; there will be no manufacturing or industrial activity involved.

"By centralizing this type of work at the general offices location we will be able to effect many efficiencies and economies," Mr. Thomas said. "There are also many benefits to be gained in having our research people in close proximity to our administrative headquarters," he added.

Designed to match the "campus atmosphere" of Monsanto's general offices, the new buildings will provide facilities for about 800 scientific personnel. Ultimately most of the company's research will be centered here. As part of the initial program, the new center will provide research facilities for the inorganic chemicals, organic chemicals, research and engineering, plastics and Lion Oil Co. divisions.

Divisional research efforts will remain under the direction of the research directors of the individual divisions, however.

Many of the personnel involved in the initial program—about 400—will be transferred from Dayton, Ohio, and from El Dorado, Ark. The transfers to St. Louis will not be accomplished for two years.

At present, Monsanto's research locations are widely scattered. The company's Lion Oil Co. division does research work at El Dorado, Ark., and Texas City, Tex.; the organic chemicals division has a laboratory at Akron, Ohio, another at Nitro, W. Va.; one in the city of St. Louis and another at the Creve Coeur site; the plastics division has laboratories at Santa Clara, Calif., Seattle, Wash., Springfield, Mass., and Texas City, Tex.; the research & engineering division has a laboratory at Dayton, Ohio, another at Everett, Mass., where research is conducted on government-sponsored projects, and operates another laboratory at Miamisburg, Ohio, for the Atomic Energy Commission. The inorganic chemicals division consolidated its research work at the Creve Coeur location in 1957, bringing to St. Louis personnel who had staffed separate laboratories at Everett, Mass., Anniston, Ala., and Dayton, Ohio.

Plans for the new Research Center allow for further expansion in successive phases which may take as long as 15 years for completion. Existing laboratories at Creve Coeur eventually will be tied in with the new structures.

The laboratories are being designed to provide the best available facilities for research work, and at the same time are being built to provide flexibility for future modification.

The architectural firm of Holabird & Root and the architectural section of Monsanto's research & engineering division are designing the plant.

Diazinon Label Cleared For 18 More Products

YONKERS, N.Y.—Eighteen fruits and vegetables have been added to the list of crops for which Diazinon insecticide has received label claims acceptance, bringing the total list to 45, reported Geigy Agricultural Chemicals Corp.

Newly added were: Grapes, cantaloupes, carrots, collards, cranberries, endive, kale, lima beans, muskmelons, parsley, parsnips, radishes, summer and winter squash, Swiss chard, turnip roots and tops and watermelons.

Residue tolerances of 0.75 ppm have been established on these crops.

PATHOLOGY HEAD

FAYETTEVILLE, ARK.—The appointment of Dr. J. P. Fulton as head of the department of plant pathology at the University of Arkansas was announced by Dr. John W. White, vice president for agriculture. Dr. Fulton succeeds Dr. E. M. Cralley, who has been named director of the University's Agricultural Experiment Station. Both appointments were effective July 1.

McConnon & Co. Names New Chief Chemist as Lee H. Ayres Retires

WINONA, MINN.—Fred W. Wirsig has been appointed chief chemist for McConnon & Co., Winona, to succeed Lee H. Ayres who has retired after 39½ years of service with this agricultural chemical manufacturing company. Norman D. Thingvold, general manager of the plant, made the announcement.

The new appointee is a native of New York, but spent several years of his early life in Germany.

Mr. Ayres, well-known in the agricultural chemical trade, says he expects to take it a little easier now, but has so many projects in mind that he wonders how he might get it all done.

He joined the McConnon staff Aug. 1, 1920 and has seen tremendous changes take place in pesticide materials and formulation techniques. He was involved with early experiments with DDT for farm use, back during World War II when the insecticide was known only by a patent number. The McConnon firm was one of the first to grind DDT in the U.S.

Mr. Ayres did take a vacation from his laboratory duties for a time to participate in capturing fish for scientific purposes. These expeditions took him to the Bahamas, Hawaii, West Indies, Cuba and Australia.

He now intends to do more fishing, but this time, for his own enjoyment.

DISEASE STUDY

BATON ROUGE—An expanded research program on the "blast" disease of rice has been announced by the Louisiana State University Rice Experiment Station at Crowley. Austin T. Harrell, superintendent of the station, and Dr. Charles N. Bollich, U.S. Department of Agriculture agronomist at the station, said that the research will be in two main branches: (1) plant breeding aimed at developing rice varieties resistant to the disease and (2) chemical control and prevention.

SF farmers plant

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Industry Men, Farmers View Demonstration

DAWSON, GA.—Agricultural specialists, fertilizer mixers, insecticide manufacturers, county agents, farmers and representatives of other professions recently studied results of a cotton fertilizer and insecticide demonstration in Terrell County, near Dawson, Ga.

W. K. Jones, a Terrell County farmer on whose farm 30.7 acres of cotton has been grown this year, fertilized and used insect control methods in strict accordance with latest technical information. He was host to visitors on his farm.

In describing his operations, Mr. Jones said skip row cotton was grown on the land in 1958. Cotton stalks were immediately cut after harvesting the 1958 cotton and the land was broken last fall. In the early spring of 1959 the land was again pulverized by scootering and harrowing.

Soil tests were made before planting. Cotton was planted the last of April and first of May, and replanting was done by hand.

"Lime at the rate of 1,000 lb. per acre was applied. In split applications, 1,150 lb. of 5-10-5 per acre were used with 700 lb. at planting time and 450 lb. as side dresser when cotton was in full bloom, and 450 lb. of ammonium nitrate used as sidedressing split applications," Mr. Jones said.

"A complete spray schedule was carried out with the first application when the first two leaves appeared April 29.

"Toxaphene and DDT were used throughout the season. One pint per acre of this material was used as first spray. Three applications for early seasonal control, 16 applications for mid and late season control. Ten applications were made by ground equipment-tractor and high-boy outfit with nine applications made by plane. All applications were sprayed on cotton. The cotton was partially defoliated by plane with a spray on Aug. 8. Fifteen pounds per acre was used.

"The demonstration field is well fruited with both bottom and middle crop of bolls with an abundance of bloom and small bolls as a top crop. Hand picking is under way. Indications are that the yield will be more than two bales per acre."

Cotton, fertilizer and insecticide dealers and manufacturers provided the seed, fertilizer and spray materials for the demonstration, with Mr. Jones providing all labor and equipment for carrying out the demonstration under supervision of the county agent, experiment station and other technical advisers.

Potash Agreement

CARLSBAD, N.M.—National Potash Co. has signed an agreement with Southwest Potash Corp. to buy 2,500 tons crude potash ore daily until a body of ore held in reserve by the federal government is opened.

The plan, reported by officials of both companies, is a temporary measure to upgrade National's present ore. Delivery of the Southwest ore to National will begin Dec. 1 and will continue until the government reserve ore body in Eddy County is opened. No date for opening of this reserve has been set.

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TICKICIDES

EL DORADO, ARK.—Aerial spraying to rid Union County of fire ants has also produced some significant side effects. A survey of dogs in the county shows that the spraying apparently has reduced the heavy tick population to almost nothing.

Results of the survey were announced recently by County Agent John Cravens and Dr. Leslie L. Lancaster, professor of entomology at the University of Arkansas, who conducted the dog canvass.

They checked 24 dogs in the sprayed area and found only five ticks among them. This was an average of .208 of a tick per dog.

They checked 17 dogs in the region that was sprayed during 1958, finding seven ticks—an average of .41 tick per dog.

The survey was made before the 1959 spraying program was completed.

A survey of dogs in the untreated areas of the county made the survey even more interesting: Eighteen dogs were inspected—and they yielded a total of 387 ticks . . . an average of 21.5 ticks per dog. One animal had 95 ticks in his fur and embedded in his skin.

Agricultural officials believe that the spraying will finally destroy most of the ticks. They say it will be several years before the tick population builds back to previous numbers.

Two NAC Assn. Speakers Unable to Attend Meet

WASHINGTON, D.C.—Two speakers scheduled for appearance on the Oct. 21-23 program of the National Agricultural Chemicals Assn. at French Lick, Ind. will be unable to meet the appointment, the NAC has announced.

Sen. Everett Dirksen (R., Ill.), minority leader of the Senate, has been ordered by his physician to cancel speaking engagements, and Dr. H. L. Haller, assistant to the administrator, Agricultural Research Administration, USDA, will be out of the U.S. at that time and will be unable to appear on the NAC program.

The NAC association says that replacement speakers will be announced as soon as possible.

The October meeting is the 26th annual convention of the association and will be conducted at the French Lick-Sheraton Hotel. Chairman of the general arrangements committee is Dr. Roger Roth, Velsicol Corp., Chicago.

B. C. Manker, Davison, Dies of Heart Attack

LANSING, MICH.—Barnard C. Manker, manager of Davison Chemical Co. plant at Lansing, died suddenly of a heart attack on Aug. 30. Mr. Manker was a long-time member of the fertilizer industry, having become associated with the Michigan Fertilizer Co. in 1928 and joined Davison at the time that firm acquired the Lansing plant of the Michigan Fertilizer Co.

Mr. Manker remained with the plant when Davison was later acquired by W. R. Grace & Co. His total years of service was 31.

He is survived by his widow and a son, Barnard Manker, Jr.

PROFESSOR RETIRES

AMHERST, MASS.—Dr. Adrian H. Lindsey of Amherst will retire on Sept. 25 as head of the agricultural economics department after 30 years of service at the University of Massachusetts. Dr. Lindsey, on accrued leave, and Mrs. Lindsey are now in Salem, Ore., where he will teach in the economics department at Willamette University during the school year. They intend to return in 1960 and maintain their residence in Amherst.

Hooker Announces Managerial Changes

NIAGARA FALLS, N.Y.—Several managerial changes have been instituted in the sales department of the eastern chemical division, Hooker Chemical Corp., Niagara Falls, announced John S. Coey, division sales manager and a corporate vice president.

William L. Gillespie has been appointed product manager, organic chemicals, succeeding Robert B. Boyd, recently promoted. Mr. Gillespie had been manager, sales administration. Succeeding Mr. Gillespie is James S. Walker, formerly manager, technical service. Lloyd S. Bovier, formerly administrative assistant to the director of research, has been appointed manager, market development, a newly created post in the division's sales department, and Kenneth R. Ewing, formerly a technical service representative, is now supervisor, trichlorethylene. Mr. Ewing succeeds Stanley A. Mattison, now Hooker's Washington manager.

Korlan Granted Registration As Cattle Insect Control

MIDLAND, MICH. — The 24% emulsifiable form of Korlan has been granted registration for use as a spray on cattle, sheep and goats for control of external parasites, the Dow Chemical Co. has reported.

Under terms of the registration, Korlan 24E is now being recommended as a ½% spray for controlling hornflies, lice and screwworms on cattle and calves and as a ¾% spray for lone star and winter tick control. On sheep, goats, lambs and kids the ½% spray may be used to control lice, sheep keds (ticks), screwworms, fleeceworms (wool maggot or flystrike) and hornflies.

Agricultural Researcher Named by U.S. Borax

LOS ANGELES—Appointment of Edward D. Wurster to the agricultural research and development department of U.S. Borax Research Corp., Anaheim, Calif., has been announced by Dr. D. S. Taylor, vice president and general manager. U.S. Borax Research Corp. is a subsidiary of United States Borax & Chemical Corp.

Mr. Wurster formerly was associated with Texaco, Inc., of Wilmington, Calif. A native of Ohio, he is a graduate of the college of engineering and commerce of the University of Cincinnati. He now resides in Garden Grove, Cal.

Spencer Launches New Sales Promotion Program

KANSAS CITY, MO.—"Don't Just Fertilize, Spencerize" is the slogan which Spencer Chemical Co. is introducing to launch and identify a sales promotion program. Known within the company as "Operation Omnibus," the program is aimed at focusing attention on the entire range of nitrogen products made by the company's agricultural chemicals division.

The "Omnibus" program will be presented via farm paper, radio, fair displays and a movie entitled "Fertilizer First." This 13-minute movie, which was produced specially for "Operation Omnibus" by Spencer advertising department, contains information about company activities in the fertilizer industry since it began commercial operation in 1946. Radio, farm paper and fair display advertising will carry out the "Don't Just Fertilize, Spencerize" theme by featuring the four "Spencerizer" nitrogen products which the company sells.

Special previews of "Operation Omnibus" were given to members of the company's agricultural chemicals division at meetings held recently at Gull Lake, Minn., and Memphis, Tenn.

California Chemical Employment Continues Rise

SAN FRANCISCO — Employment in chemical manufacturing industries continued its climb in California during July by reaching a new level of 38,900 for the month, as compared with 38,600 for June. This figure represents a gain of 1,500 from the "recession" period of last year when 37,400 were employed making all kinds of chemicals. The estimates have been compiled by the division of labor statistics and research of the California State Department of Industrial Relations.

Earnings in the production worker segment of the agricultural chemicals division of the industry rose between June and July from an estimated average of $100.43 per week to $103.25, as compared with $91.03 for the previous July. Hourly earnings for the three months were $2.42 in June, $2.47 in July, and $2.34 last June. The average number of hours worked were, in the same order, 41.5, 41.8 and 38.9.

ARIZONA APPOINTMENT

PHOENIX, ARIZ. — George Hayduke has been named credit manager of Arizona Fertilizers, Inc., according to an announcement by Frank Feffer, Sr., president. Mr. Hayduke was formerly associated with the San Carlos Irrigation and Drainage District of Arizona.

BREAKTHROUGH

(Continued from page 1)

ergy.) (An Angstrom unit, a measure of wavelength of light, is one millionth of a centimeter.)

Colors in the yellow and orange range of 5,800 to 6,300 A. are absorbed largely by the red-absorbing pigment form, moving the photoreaction toward the production of the growth regulating form.

The red-absorbing form can utilize more light in the 6,300 to 6,700 A. region, red-orange to red than in other ranges. Therefore, this is the range requiring the least amount of light energy to convert this pigment form to the regulating pigment. Both pigment forms are present in this range of colors, but the regulating type predominates.

It is the selective absorption of the various colors of light by the two pigment forms that apparently governs many phases of a plant's development, including flowering, germinations, and elongation, and that promises to add even more knowledge of plant development.

Maximum suppression of germination of Great Lakes lettuce seed takes place near 7,000 A. The scientists also found that elongation of the lettuce root was controlled by the color of light. Elongation was found to be suppressed at 6,100 A. (orange) and stimulated by exposure to light in the far-red region of 7,500 A.

The intensity of light also has a marked effect on the germination of lettuce seed. Exposed to light of 7,500 A., for example, an intensity of .8 microwatt per square centimeter results in about 70% germination. An increase to two microwatts gives about 35% germination, while 30 microwatts reduces the germination to almost zero.

These differences, the scientists point out, vary according to the wavelengths of light being used in the experiment. Below wavelengths of 6,800 A. there are no appreciable differences in germination between the three levels of light intensity (.8 to 30 microwatts).

Research in the News

Small patches of perennial weeds can be nearly eliminated if they are treated with soil sterilants right after harvest, says Keith Wallace, weed specialist for the South Dakota College extension service.

The reason: "Soil sterilants applied in the fall remain potent for a long time. Weeds continue to grow until the hard freezes come. During this period and in early spring the sterilants take their toll. Great harm is done to weed roots. Weeds go into winter in a weakened condition. They also suffer further damage from cold weather," says Mr. Wallace.

The cost: The specialist says anywhere from 50¢ to $1 per square rod, depending on the chemical. That means a small patch that might be eliminated for a couple of dollars this fall could spread to an area ten times as big next year. It will also cost about 10 times as much to eliminate it.

Mr. Wallace said that soil sterilants do not kill ungerminated weed seeds in the soil. "New infestations can easily be controlled with cultivation or a dose of 2,4-D when they appear," he said.

•

Generous applications of fertilizers on grass pastures mean extra dollars profit for the dairy farmer, according to reports from the extension department of the University of Minnesota. As a good example, the university points out a Mille Lacs County farmer, Abdon Peterson, for whom good management and extra fertilizer last summer meant an extra $30 in dairy profits from each acre of grass pasture.

Upon advice from his county agent, Clayton Grabow and extension specialists from the University, Mr. Peterson made a thorough study of his operations to see if fertilization would really pay off. Here's what he did, and how the results stacked up:

On five acres of grass pasture, he put 200 lbs. of ammonium nitrate and a couple bags of phosphate and potash fertilizer an acre in May. A month later, he gave each acre another 100-lb. dose of ammonium nitrate.

He left an acre of the same kind of grass unfertilized.

The cows grazed both the fertilized and unfertilized pastures by a "ration-a-day" system—just enough area at a time for a day's eating.

The difference was plain enough for anyone to see. On the first grazing, each acre of fertilized pasture fed the cows for more than 5 days, compared to 2 days for the unfertilized acre.

Then after the second fertilizing, the 5-acre pasture was good for another 24 days total grazing in midsummer. But the unfertilized acre petered out and furnished no feed at all after the first grazing.

All this time, Mr. Peterson was keeping track of which pasture the cows were on, how much feed they got in the barn, and milk production. "It turned out that the extra milk from the fertilized pasture, compared to the check, was worth $30 more per acre after subtracting feed and fertilizer costs," he says.

He adds, though, that a farmer won't always get that big an increase. "Last summer, there was plenty of rain, which is needed for fertilizer response. This year, though, it's been a little too dry to get as good a fertilizer response." But he feels the extra kick from fertilizer is always enough to more than pay the added cost.

Mr. Peterson also learned that potash is important in this area. Where too little was applied, there wasn't much growth.

INSPECTION NOTICE

UNIVERSITY PARK, N.M. — All persons in New Mexico using weighing and measuring devices which have not been inspected under the New Mexico Weights and Measures Law, should notify the superintendent of weights and measures, New Mexico State Department of Agriculture, Box 457, University Park.

The law, which became effective July 1, requires that all such devices be inspected and approved or condemned. The standards that have been set for New Mexico are the same as those used by the National Bureau of Standards in checking weighing and measuring devices.

Simplot Starts Sulfuric Acid Plant Operation

POCATELLO, IDAHO—The J. R. Simplot Co. has started operating a 400-ton-per-day sulfuric acid plant here.

The plant was designed, engineered and constructed by Leonard Construction Co., and uses recovered sulfur from local refineries.

Also used is vanadium sulfuric acid catalyst, manufactured by Monsanto Chemical Co.

EMPLOYEE STOCK

MIDLAND, MICH.—An offering of 120,000 shares of common stock of the Dow Chemical Co. to its employees and those of its subsidiaries and certain associated companies was announced. The new offering, to be known as the 1959-60 Employee's Stock Purchase Plan, will be the eleventh since the company started selling common stock to its employees on an installment basis in 1948.

Symposium Scheduled

WASHINGTON — A committee of the National Agricultural Chemicals Assn. and the Entomological Society of America will sponsor a symposium on the subject of "Research Progress on Insect Resistance," to be held at the Mayflower Hotel here Oct. 7-8.

All papers scheduled for presentation by the program participants will be published as soon after the symposium as possible.

EXPANDS STAFF

WILMINGTON, DEL. — The addition of an economic evaluation engineer and a marketing analyst to the staff of Atlas Powder Co.'s newly-formed development appraisal department has been announced by James B. Weaver, departmental director. Thomas A. Rivenbark was named to the department's economic evaluation section, and Clarke W. Slade, Jr., to the marketing research section.

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ENTOMOLOGISTS PONDER . . .

Are Rocky Mountain Grasshoppers Extinct, Making Locust Plague a Thing of the Past?

PESTICIDE MAKERS are always on the alert for the possibility of unusual outbreaks of insects which would put a strain on both manufacturing facilities and distribution setups around the country. If only we could know far enough in advance that weather and other conditions would bring about such situations so allowances could be made.

Speculation is always focused on whether or not locusts or grasshoppers might be abundant in any given season. The weather has a great deal to do with it, particularly rainfall, but apparently exactly the right conditions have not been present for a major "plague" of locusts of the type described by historians concerning the period of the 1870's when the Great Plains were devastated by migratory locusts.

Stories told of those days, and there is good evidence to substantiate most of them, indicate that literally billions of grasshoppers moved southward in wave after wave out of Montana, the Dakotas, and western Canada, traveling at an estimated rate of about 20 miles a day, as far south as Texas and eastward into Missouri. In many extensive areas they devoured nearly all vegetation in the way, leaving mere remnants of crops behind them.

Reports say they moved in enormous hordes, often blacking out the sun. The wingless nymphs traveled along the ground in breeding areas in armies with solid fronts a mile long in many instances. Along railroad tracks they sometimes stopped trains because of the slipperiness of their crushed bodies. The invasions reached their peak in 1876, when they constituted a major economic disaster for settlers.

In the late 1870's the invasions slackened, and the main species represented, the Rocky Mountain grasshopper, seldom attracted widespread attention again. The last authentic specimens were collected in 1902. A review of the strange disappearance of this notorious grasshopper is included in a taxonomic report on the genus Melanopus, to which this species belongs, and has recently been published by the Smithsonian Institution.

The report is by Dr. Ashley B. Gurney of the U.S. Department of Agriculture and A. R. Brooks of the Canadian Department of Agriculture. Reasons for the disappearance of the Rocky Mountain grasshopper cannot be determined, the authors say. Some entomologists have regarded it as extinct like the passenger pigeon, and others have attributed its decline to the removal of the great buffalo herds which occupied much of the same region and which were destroyed by hunters at about the same time.

The possibility that a nucleus or remnant population of this grasshopper still exists somewhere, although not an established fact, hardly can be ignored.

That there have been similar grasshopper hordes in the past, it is pointed out, may be indicated by the so-called "grasshopper glacier" in Montana's Beartooth Mountains where layers of grasshoppers are found imbedded in ice. Melting of the ice leaves piles of remains from two to four feet deep. Presumably, according to Dr. Gurney, grasshopper hordes flying over the glacier, became chilled and landed on the ice where they may have been trapped by snowfalls and remained permanently preserved. All this happened within the past 600 (or probably 200) years, according to carbon-14 age determinations.

A speculation advanced in the report is that this species of grasshopper, as is known to be the case with some other species, exists in two "phases," a solitary phase and a swarming phase. The solitary phase may continue for many years. All the grasshoppers remain in the same general locality and increase in numbers slowly, if at all. There is little evidence of any horde assemblies.

Then, for reasons still unknown, but probably correlated with climatic changes, great population increases take place, the urge to migrate occurs, and great invasions begin. It is possible, according to the report, that the solitary phase still persists somewhere, probably in small isolated colonies which have not attracted the attention of entomologists. If so, during the past half century the necessary stimulus for a great increase in numbers accompanied by a greater flying ability and the urge to migrate long distances evidently has not been present.

During this period, however, various other grasshopper species, including close relatives of the Rocky Mountain grasshopper, have had several notable periods of outbreak, and grasshoppers are extremely destructive in some states almost every year.

So there is still a possibility of recurrence of the oldstyle sun-blackening locust infestation, although it is apparently remote. Entomologists keeping an eye on such developments, as well as on the progress of other insect populations, perform a real service for the pesticide trade and for the farmer.

Where have the missing species gone . . . and are they really extinct? These are questions that pique the imagination. If really extinct, then there is no point in expecting possible migrations of these creatures, but if the potential is still present, who knows just when the secret combination of conditions might coincide to spark another such outbreak?

Pesticide Misuse Continues To Undo Good Will Efforts

AFTER ALL the efforts made by pesticide manufacturers and dealers to prevent misuse of valuable insecticides, some people seem prone to perform foolish acts that nullify all the good will built up in a community over a long period of time.

A recent incident in Mississippi is a shining example. A farmer who apparently wished to re-use his empty chemical barrels, washed them out and rinsed them thoroughly in the waters of the Tallahatchie River. The toxicant, carried downstream, reportedly killed thousands of fish in the stream. Local game wardens, along with state game and fish commission spokesmen said that a five-mile stretch of the river was "covered with the bodies of dead fish." They described it as "one of the worst fish slaughters on record."

Had the farmer not been informed of proper ways to dispose of empty containers? Did he not read label instructions as to safe use of material and cautions to be observed? Did his dealer mention any of these things to him at time of purchase?

Possibly the farmer knew some of these precautions, but simply failed to "stop and think." Whatever the reason may have been for this type of carelessness, the result could well provide more propaganda to various groups who are always gunning for legislation to outlaw pesticides from many important applications.

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Oct. 29-30—Far West Safety School, Hacienda Motel, Fresno, Cal.

1960

Jan. 27-29—Symposium on Chemistry of Phosphate-Soil Reactions, Muscle Shoals, Ala.

Meeting Memos listed above are being listed in this department this week for the first time.

Sept. 17—New Jersey Fertilizer Conference, Rutgers University, New Brunswick, N. J.

Sept. 20-23—Seventh Annual Meeting Canadian Agricultural Chemicals Assn., Chateau Frontenac, Quebec City.

Sept. 24—Fertilizer Technology & Economics School & Tour for California Bankers, University of California, Berkeley, Cal.

Sept. 24-25 — Annual North-Eastern Fertilizer Conference, NPFI, Biltmore Hotel, New York, N.Y.

Sept. 25—Annual Crops Day, University of Arizona, Safford, Ariz.

Sept. 30-Oct. 1—Fourth Southeastern Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Oct. 7-8 — Symposium on Research Progress on Insect Resistance, Mayflower Hotel, Washington.

Oct. 12-14—Association of Official Agricultural Chemists, annual meeting, Shoreham Hotel, Washington, D.C.

Oct. 13-14—Western Agricultural Chemicals Assn., fall meeting, Villa Motel, San Mateo, Cal., O. O. Barnard, executive secretary.

Oct. 14-16—Pacific Northwest Plant Food Assn. Annual Convention, Chinook Hotel, Yakima, Wash.

Oct. 15—NPFI Conference on Chemical Control Problems, Shoreham Hotel, Washington, D.C.

Oct. 16—Association of American Fertilizer Control Officials, Shoreham Hotel, Washington, D.C.

Oct. 16-17—American Pesticide Control Officials, annual meeting, Shoreham Hotel, Washington, D.C.

Oct. 19-23—Fertilizer Section, National Safety Council, annual meeting, Chicago.

Oct. 21-23 — National Agricultural Chemicals Assn., 26th annual meeting, French Lick-Sheraton Hotel, French Lick, Ind., Lea S. Hitchner, executive secretary.

Oct. 27—Seventh Annual Grassland Farming Conference, Extension Service, Rutgers University College of Agriculture, New Brunswick, N.J.

Oct. 29-30 — Eastern Branch, Entomological Society of America, Chalfonte-Haddon Hotel, Atlantic City, N.J.

Nov. 3-4—Michigan Insecticide-Fungicide Conference, Michigan State University, East Lansing, Mich.

Nov. 4-5—Fifth Annual Oklahoma Fertilizer Dealers and Crops and Soils Conference, Stillwater, Okla.

Nov. 4-6—Fertilizer Industry Round Table, Mayflower Hotel, Washington, D.C. Dr. Vincent Sauchelli, National Plant Food Institute, chairman.

Nov. 8-10—National Fertilizer Solutions Assn., Annual Convention, Statler Hilton Hotel, St. Louis; Muriel F. Collie, 2217 Tribune Tower, Chicago 11, executive secretary.

Nov. 9—South Carolina Plant Food Educational Society annual meeting, Clemson House, Clemson, S.C.

Nov. 9-11 — California Fertilizer Assn., 36th annual convention, Fairmont Hotel, San Francisco.

Nov. 12-13 — Southwest Fertilizer Safety School, Tropicana Motor Hotel, Pasadena, Texas.

Nov. 16-20 — National Aviation Trades Assn., 20th annual convention, New Orleans, La.

Nov. 30-Dec. 4—27th Exposition of Chemical Industries, New York Coliseum, New York City.

Nov. 30-Dec. 5—Joint meeting, Entomological Society of Ontario; Entomological Society of Canada and Entomological Society of America, Hotel Sheraton-Cadillac, Detroit, Mich.

Dec. 1-2—Annual meeting, Carolinas-Virginia Pesticide Formulators Assn., Carolina Hotel, Pinehurst, N.C.

Dec. 2-3—Annual Missouri Fertilizer Conference, Columbia, Mo.

Dec. 7-10—Central Canada and North Central Weed Control Conferences, Royal Alexandra Hotel, Winnipeg, Manitoba, Can.

Dec. 8-10—Joint Meeting of Western Canadian and North Central Weed Control Conferences, Winnipeg, Manitoba.

Dec. 9-11—International Crop Protection and Pest Control Exhibition, Seymour Hall, St. Marylebone, London, England.

Dec. 10-11—Annual Arkansas Plant Food Conference, Little Rock, Ark.

1960

Jan. 5-6—Annual Texas Fertilizer Conference, College Station, Texas.

Jan. 6-8—14th Annual Meeting, Northeastern Weed Control Conference, Hotel New Yorker, New York City.

Jan. 13-15—Ninth Annual Convention, Agricultural Ammonia Institute, Statler Hilton Hotel, Dallas, Texas.

Jan. 14-16—10th Annual Convention of the Agricultural Aircraft Assn., El Mirador Hotel, Palm Springs, Cal.

Jan. 20-21—North West Agricultural Chemicals Industry Conference, Benson Hotel, Portland, Ore., C. O. Barnard, executive secretary.

Jan. 20-22—Southern Weed Conference, 13th annual meeting, Biloxi, Miss.

Jan. 20-22—Thirteenth Annual Southern Weed Conference, Buena Vista Hotel, Biloxi, Miss.

Jan. 25-27—Cotton States Branch, Entomological Society of America, DeSoto Hotel, Savannah, Ga.

Jan. 28-29—Annual meeting of the Colorado Agricultural Chemicals Assn., Cosmopolitan Hotel, Denver, Colo.

Feb. 8-9—Southwestern Branch, Entomological Society of America, Hilton Hotel, El Paso, Texas.

March 23-25—North Central Branch, Entomological Society of America, Schroeder Hotel, Milwaukee, Wis.

June 27-29—Pacific Branch, Entomological Society of America, Davenport Hotel, Spokane, Wash.

CALENDAR FOR 1959-60

SEPTEMBER						
S	M	T	W	T	F	S
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OCTOBER						
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NOVEMBER						
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DECEMBER						
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JANUARY						
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JULY						
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AUGUST						
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28	29	30	31			

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Rates: 15¢ per word; minimum charge $3.25. Situations wanted, 10¢ a word; $1.50 minimum. Count six words of signature, whether for direct reply or keyed care this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of $11 per column inch.

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Fisher Porter Meter & Recorder
All in good condition

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